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Briefing

IBM raises its prices

IN a New Year surprise for users, IBM has increased purchase and rental prices on the 43[illegible] 8100 and almost all other [illegible]ducts apart from 303X lines.

[illegible]S rents and leases rise 7% purchase prices 5% on almost all computer products, while purchase prices of word processors rise 7%. The sting in the tail is that monthly maintenance charges rise between 10% and 20%.

Purchase prices go up on January 7 and rents and leases on April 1.

Ferranti profits up

HIT by engineering and other strikes, Ferranti managed a 9.3% improvement in pre-tax profit to £3.5 million on turnover up 15.5% at £85.3 million for the six months to September 1979. The National Enterprise Board is not expected to sell its 50% stake in Ferranti before the end of the financial year, but chairman Sebastian de Ferranti and director Basil de Ferranti have sold parts of their shareholdings. Sebastian now has 4.3% of the total shares and Basil 6.1%.

Personal debut

HEWLETT-PACKARD has today moved into the personal computer market with the system that has carried the company code name of Capricorn (CW, February 1, 1979). The existence of the system has never been officially admitted by the company but it has long been forecast and is expected to use the Visicalc software from the US supplier Personal Software (CW, September 27, 1979).

Nexos director

JOINING Nexos as sales and marketing director is Peter Hooton, formerly a staff manager with IBM UK's Data Processing Division and boss of Muir Moffat, now managing director of Nexos. Hooton is also joining the board of the National Enterprise Board's office systems firm.

Giro order

THE Giro in Sweden has taken a similar approach to the UK Giro by going over to low cost OCR workstations for capturing data from remittance documents. The Swedish Giro has just ordered 43 Burroughs S3800 systems worth nearly $3 million, while two years ago the UK Giro decided to replace several big Recognition Equipment OCR systems with about 150 Lundy Farrington workstations.

Plato for AT&T

CONTROL [illegible]ding a [illegible] Plato [illegible] terminals [illegible] Current [illegible] terminals are mainframe dependent but AT&T is believed to be interested in a terminal which operates separately but refreshes its memory periodically from a mainframe.

Jim Godwin (left), head of the Statistics and Computer Science Department at Holloway College, London University. At the presentation he received a token bottle of Champagne from CW editor John Kavanagh (second left).

Pet for crossword winner

WINNERS of the Master Resources Ltd tenth anniversary crossword competition, which was co-sponsored by Computer Weekly, came to London just before Christmas to receive their prizes.

MRL managing director Ron McQuaker (right) presented the first prize, a Pet Model 1 personal computer with 8K of RAM and an integral cassette recorder, to David Yates, seated at the keyboard. Yates is concerned with research in the Numerical Analysis and Computer Science Department at the National Physical Laboratory, Teddington, Middlesex.

The second prize, a case of wine given by Computer Weekly, was won by Professor

The competition proved one of the most popular published in Computer Weekly attracting over 500 entries, and Alec Robins (centre), who compiled the competition puzzle for MRL and who is one of the leaders in the art of the crossword, is to set a monthly prize puzzle in Computer Weekly. Readers who went to test their skill will find the first competition square in page 30.

Gamma bought by US company

THE financially ailing UK systems house, Gamma Associates, is to be bought by PRC International, the US owned firm that used to hold a majority share in Logica.

PRC expects to finalise the Gamma takeover by the middle of this month but is not prepared to reveal yet what changes if any will be made in the management of the Nottingham based systems house.

PRC International is part of the Planning Research Corp of Washington DC, a company which derives roughly half its total worldwide revenues of $270 million from information sciences and the remainder from engineering and architectural consultancy. PRC employs 7,000 people including 600 in the UK and operates in 42 countries.

Tom Walker, who is in charge of PRC International's information science activities in Europe, told Computer Weekly that he was approached by Gamma in mid-December. PRC had been on the look-out for European acquisitions since it sold its holding in Logica in 1978 and was seeking further acquisitions in addition to Gamma.

Walker was attracted by Gamma's size as a Digital Equipment OEM customer and by the size of Gamma's order book. He blamed the crisis at Gamma on "a capitalisation problem." PRC planned to buy all the shares in Gamma including the 25% held by Gamma's managing director, Dr George Coggan, and the holding worth £200,000 that was acquired late in 1978 by various major UK financial institutions (CW, November 8, 1979).

PRC does about $5 million worth of business a year worldwide installing DEC based computer systems but its DEC oriented activities in the UK are insignificant compared with Gamma's.

According to Tom Walker PRC International has about 50 staff in the UK on the information sciences side. One current project is the development of a mathematical model in London for the Saudi Arabian government.

IBM solution for System 38

THE outcome of IBM's gargantuan effort to get the System 38 to perform to specification is a dramatic increase in minimum main memory capacity. The minimum on the smaller Model 3 has been more than doubled from 512K-bytes to 1.28 megabytes with an option of a further 256K-bytes to bring it up to 1.5 megabytes. The Model 5, which previously had main memory capacities of 1 megabyte or 1.5 megabytes, now comes with either 1.79 or 2 megabytes. The smaller processor cycles at 1.2 microseconds and uses IBM's slow 64K-bit device; the larger cycles at [illegible] nanoseconds and uses a hybrid 32K-bit part.

First UK deliveries are now set for October and IBM has acted to reduce pressure of demand on the smaller 38 by proposing to double maximum main memory on System 34 but not make it available in the UK until April 1981; American users will get it in January 1981. This move looks as clear an indication as IBM ever gives that it plans a long life for System 34, which was announced over two years ago (CW, April 21, 1977).

First UK System 38 deliveries are now scheduled for October this year. IBM originally planned to make first deliveries in the fourth quarter of 1979 (CW, October 26, 1978).

IBM has priced two configurations, but since they are quite different from the ones it priced previously, it is not clear whether users will have to pay extra for the mandatory extra memory. A System 38 Model 3 with 1.5 megabytes of main memory, 256 megabytes on disc, line printer and ten displays costs £114,103 or £3,049 a month, and a Model 5 with two megabytes of main memory, 1200 megabytes on disc, line printer, tape unit and 20 screens costs £210,905 or £5,639 a month.

The problems with System 38 apparently arose when the independent elements of the system were brought together for the first time. The System 38 is built in what IBM calls multi-layer architecture, consisting of hardware logic, horizontal microcode, vertical microcode, the operating system and the utilities. Each was designed by a different team working to pre-established interface specifications, and while each module worked to specification in isolation, when they were brought together the process ground to a halt.

US users have also been told that a key set of utilities converting applications running under the System 3 Communication Control Program to run on System 38 was behind schedule and might be withdrawn.

US observers believe that the massive increase in main memory is entirely to meet the unanticipated requirements of the system software, indicating that many of the functions normally handled by application programs are taken over by the system and that user memory space will be fairly small. This would mean that there would be little scope for independent software suppliers to write software for System 38.

IBM says that 180 System 38s are already installed in its offices worldwide for employee education, and that customer training will begin in February.

Inmos picks Bristol for first factory

BRISTOL has been chosen by the National Enterprise Board's microelectronics venture Inmos, as the location for its first UK production facility, a 150,000 square feet factory that will cost £24 million and employ 1,000 people by 1983. Inmos executive director Ian Barron said that the Bristol factory would be producing "tens of millions" of memory devices in 1982.

The first device will be a 16K static RAM followed by the 64K dynamic device that Inmos believe will be a commercial success despite its late arrival on the market (CW, November 8, 1979). Production of microprocessors will start in 1983.

The factory is to be built near the M32 motorway on the north-west side of Bristol.

The National Enterprise Board has endorsed the Inmos decision to go ahead at Bristol, which is already the location of the Inmos head office. But a question mark still hangs over the whole project because the Industry Secretary, Sir Keith Joseph, has still not approved the investment of the second £25 million of the £50 million assigned to Inmos by the previous government. About £8 million of the first £25 million has already been spent so the second tranche of money is essential for the Bristol factory to be built.

However, the Industry Secretary's publicly stated enthusiasm for the NEB's high technology activities suggests that he has already privately given his blessing to the Inmos venture.

Last Thursday the NEB said that it would be seeking his consent for the second £25 million "within the next few days." But it is unlikely that approval will be given immediately.

● Turn to back page

INSIDE THIS WEEK'S CW....

INTO THE EIGHTIES

In our first issue of the new decade Computer Weekly writers look at what the next 10 years could bring in areas ranging from mainframes to microelectronics and from programming to the impact of computing on society. Pages 2/3

YOUR JOB LOT

The New Year is traditionally a time when people start thinking of changing jobs. How will the job scene change during the Eighties? George Penney of the National Computing Centre considers the prospects for data processing staff. Page 16

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COMPUTERVIEW for the Eighties...

Shift in direction likely

AFTER two decades of rapid technological development the semiconductor industry is likely to slow down a little and change its orientation slightly.

It is probable that much of the new technological development will spring from systems manufacturers with in-house production facilities, rather than the semiconductor companies. There will certainly be a 32-bit

Semiconductors

microprocessor developed, though this might well be dedicated to specific applications rather than be general purpose. There will also be developments in such technologies as wafer-scale integration using VLSI processing techniques as well as the appearance of new products using gallium arsenide and other Group IV-V metals in place of silicon. The latter will remain the dominant material in semiconductor processing.

Of more immediate interest will be the maturing of the 64K-bit RAM market. This is now unlikely to occur until around 1983.

As the market matures, the industry will start announcing the next stage, the 256K-bit RAM, and introducing samples.

As an end-of-the-decade long-shot watch for the development of optical logic switching techniques as a replacement for electronics. This could be particularly relevant in the data communications area. More important, possibly, will be developments in ternary logic as a replacement for binary.

MB

Violent upheavals over

ONE only has to mention plated wire memory to demonstrate the ease with which a bright new technology can came and go in very much less than a decade. Are IBM's much-trumpeted Josephson Junctions, super-cooled and shining in their cryogenic bottles, really the technological wave of the 1980s? Or is the company deliberately laying a trail of red herrings to deceive its competitors, in particular Japan Inc, into investing in a great deal of very expensive research leading to a dead end?

In the mainframe world, the 1970s were very much the decade of disillusion, when all the manufacturers, even IBM, learned to their cost that you can't fool all the users all of the time. After the agonising conversion from IBM 360 to IBM 370 for fairly trivial performance gains, users grew wise and companies like ICL, which tried the same trick in trying to convert users from George 3 to VME/B, found the going very much tougher.

All the signs are that in the mainframe business the ICL conversion and the rather

Mainframes

smoother path laid down by NCR for its users are the last violent upheavals that manufacturers will be able to perpetrate on their users. Univac has seen the light and shelved its plans to merge OS/1100 and VS/9, while Honeywell has apparently gone one better with GCOS-8, producing an operating system claimed to be completely new, yet totally compatible with GCOS III.

In the mainframe world, the 1980s promise to be a decade of stable and mature operating systems, whatever the underlying technology, with ICL, NCR and Honeywell slightly better placed than their competitors by virtue of the comparative modernity of their offerings.

Dr Gene Amdahl's thesis that it is an IBM software world, and will be seen to be so in the 1980s, remains unproven. Whatever IBM can do to fight off the competition, without disturbing its own base too much, it will do. But it faces the very real danger that as plug-compatible competition from Amdahl, Nasco, Magnuson and the Japanese becomes more intense, the company's attempts to fight them off will alienate its own customers to the benefit of the non-compatible competition.

TRP

Bigger and better

IN the microcomputer market, there will be a continuing trend towards larger hardware systems, caused by the need to run idiot proof software suitable for first-time users. Typical minimum memory size will rise to 64K bytes and there will be growth in the use of 16-bit microprocessors as the basis of these systems.

To ease the software development problem, there is likely to be rapid growth later in the decade of ROM-based firmware applications packages. In association with this, there will

Micros

also be a trend towards the use of bubble memories in small systems, but only at an up-market level, probably 5 megabytes and above.

There will still probably be a market for small, low-cost systems in the £400-£600 range, but these will tend to be used mainly as learning tools from which users can upgrade when they understand their own applications and problems.

Though there are problems with existing algorithms there should be developments in speech synthesis and recognition systems. This could create a new market for hand-held "talking computers", similar to present-day calculators. Taken together with Prestel interfacing systems for microcomputers, this could open up a true domestic and personal computer market.

The rapid growth of the market for microcomputers will tempt the big computer manufacturers, such as IBM, to enter the business. They have the capability to obliterate the existing manufacturers by the end of the decade.

MB

Emphasis on the user

NOBODY in the software market will be surprised to hear that a recent international market research report predicts an "explosive sales potential" for software in the next 10 years. A safer prediction, perhaps, than some which have been made about the Eighties concerning the imminent death of Cobol, the total dominance of IBM or even the decline and extinction of the common programmer in favour of a breed which doesn't know what assembly code is, let alone write it.

The determination of the end-user to get his hands on the machine is evident in the number of applications already on the market which aim to cut out the DP middleman. Such user-aimed products might mean that the advances made in Artificial Intelligence research in the last 10 years might now become commercially valuable, particularly in the field of voice recognition and even simulation.

"User-friendly" aids might also give rise to another field of software specialisation, devising security against not-so-friendly users.

Although there will be wide scope for specialisation, the Frost and Sullivan report on "The US Software Package

Software

Outlook in Small Business Computers" predicts that more than a million packages will be sold in the next 10 years, unit sales increasing from 60,000 packages this year to 185,000 in 1988.

If this country follows the trend predicted for the US, there should also be an increase in the importance of systems software, and tremendous expansion in the microcomputer field.

Earlier this year Peter Willson of Altergo evaluated the impact of the new generation of hardware heralded by the 4300 series, predicting a return to the basics such as payroll applications for the new machines, as well as an era of user-related software cutting out the programmer, and increase in consultancy and customer support.

Software houses should find plenty of opportunities to expand into this field of customer services, provided that they can find the staff and cope with the problems of expansion: not easy in organisations whose assets are knowledge and experience.

As for the languages of the Eighties, Pascal looks promising, Ada is still in the wings, and Cobol, according to its supporters, is making a determined comeback with enhancements unlikely to appear in ANSI standards until 1987.

CG

No one answer

IT IS a decidedly risky business to look 10 years ahead when the social implications of technology are considered. However, trends that can be discerned include the enormous effort so far directed at solving the problems of technology-induced unemployment — an area where trade unions will continue to be highly

Futureview

active — the very important use of computers in education and, following on from that, a greatly increased public awareness of technology.

On technology and employment, there is no single answer; a carefully co-ordinated set of actions will be required to steer society successfully through the 1980s. And these actions must be agreed between the government and relevant trade unions for, just a few years away, it is likely that we will see what can only be called super-unions: large white-collar unions formed by mergers of smaller organisations with overlapping interests. Super-unions will control enough members to be a serious threat to government policies they don't agree with.

One has only to remember the Civil Service and Post Office worker strikes of 1979 (where the computer was used as an industrial weapon with great power to disrupt the running of the country) to gauge what kind of disputes the next 10 years could bring.

We will see a contraction in the size of the working week, slowly at first but the pace will quicken. Considerably more emphasis will, and must, be placed on the continuing education of workers, for if other radical changes occur in manufacturing processes those with limited skills could face a bleak future.

In this latter area the use of computers in education promises much. At the time of writing, there are relatively few good computer-aided instruction systems on the market but far more sophisticated ones will follow and even hand-sized teaching computers of immense power will make their mark.

People of the Eighties who care will realise the importance of technology as a "shield" erected between themselves and the harsh outside world, and attempt to keep in touch with its progress. For if they don't, the shield may fail.

RW

Hard to say...

FORECASTING social developments is always dangerous. A prestigious US thinktank did a lot of crystal ball-gazing back in the Sixties and came up with plenty of sensible ideas. The only trouble was that it failed to predict either the oil crisis or the advent of urban terrorism. So totally new developments may mould the future, rather than

Society

just extensions of current technology and social thinking, and these no one can foresee.

However, one can get a rough feel for the next 10 years by looking back over the last decade. How much has the way we live our lives changed since 1970? Remarkably little. We have calculators and digital watches, but one could easily fail to notice them. Computers are very much more widespread, but the numbers of people required to run them have offset the jobs displaced.

We still have traffic jams, our cars still won't start on cold winter mornings and there is still a housing shortage. Who would claim these things will be different in 1990? (Of course there may be no oil at all for cars in 1990.)

What about the new uses of computers that are predicted? Will we all be working from terminals at home? But people like getting out of the house and mixing with their workmates. Will children learn everything from computers, possibly also at home? This ignores the fact that education is largely a social experience — that learning how to deal with other human beings and understand how they think is far more important than absorbing facts and mathematical skills. There is plenty of future for schools, and maybe by 1990 most of them will have the equipment to teach our children about computers.

Those who hold the view that there will be jobs for only a few of us soon seem now to be on the defensive. Sir Keith Joseph put it, "Mankind has not yet reached sotiety," nor will it in the foreseeable future.

Other factors than technology will be major influences on employment in Britain: for instance, the rise of manufacturing in Third World countries such as Korea.

Services must be the mainstay of the UK economy. Education could be our major export. But will business, the unions and the government be adaptable enough to bring this about? It's hard to say.

RJ

Roles will change

IT goes without saying that over the next decade the role of the average programmer, if one exists, will change dramatically if not disappear altogether. With the expected rapid growth in the use of software generators and standard packages the number of programmers currently engaged in program maintenance will no doubt fall by at least 50%.

With the falling cost of hardware the pressure is on software houses to produce software quickly and efficiently and as a consequence large teams of pro-

Programmers

grammers poring laboriously over a payroll or accounting package will not only be undesirable but obsolete. Also more homes, installations and even schools will be able to afford small computers and the ability to understand and program a machine will no longer be a privilege belonging to expensively trained personnel.

So what are programmers going to do? After the much publicised shortage of qualified systems analysts and programmers, which has given rise to extensive government retraining schemes, it rather looks as if they will have to be untrained again and returned to some more relevant occupation. Those who survive will have to

● Turn to page 3

1984 and all that . . . .

THIS week's example of the strange things said in the media about computers was sent in by Dave Pursons of Watford, who wins £5.

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MODATA ...

...CW writers look ahead

Keith Jones — Robin Webster — Rory Johnston — Tim Palmer — Claire Gooding — Donald Kennett — Martin Banks — Judith Morris — Bernard Allen

● From page 2

channel their skills towards designing advanced and complex network systems for large companies and government.

The safest path that a programmer could pursue seems to be one of specialisation or one that moves away completely from the mystery and isolation surrounding the computer and towards the nature of his employer's business, which after all is what it is all about. Sooner or later anyone and everyone is going to know all there is to know about computers and there will have to be more people around who can actually remember what the things were meant to do in the first place.

There will be some applications, of course, for our programmer to cope with, for example, writing software for plug-in program modules for personal and home computers. But for the hordes of minions beavering away in some remote local authority installation, the Eighties do not pose much of a threat, but certainly don't hold a great deal of promise.

JM

Variety the keynote

THE decade will open with the installation by the Post Office of the first System X exchanges. However, Strowger exchanges will be in use until the end of the decade and even up to the year 2000.

During the next few years data networks will develop more rapidly but if they are to penetrate the market fully much

Telecoms

work needs to be done on making them easier to use.

Viewdata services such as Prestel will become an established feature of the business scene but may find themselves in competition with communicating word processors having graphics capabilities and able to attach to packet networks.

In the domestic market viewdata will face a hard struggle unless terminal prices drop considerably, and here the adapter market may prove significant with the initiative being taken by smaller companies.

Digital transmission of voice traffic is already widely used and with the growing importance of data traffic to add impetus this technique will soon be extended to subscriber premises, even before System X is in general use.

Some of the liberalisation of the Post Office monopoly will allow much greater variety of equipment to be attached such as the intelligent telephones that are now being imported supposedly for use on private networks.

Technological barriers to useful information services have been largely overcome; now the main work is in co-ordination of standards, the politics of regulation and the understanding of markets.

Enabling personal computers to access information services will be a major influence in bringing prices down. Any differences between services will be catered for by simple add-on modules once a cheap network barrier box has gained Post Office approval.

Late into the Eighties electronic funds transfer is an inevitable addition to the packet network, and both the Post and Telecommunications Businesses are looking at systems for electronic mail.

An enhanced telex service is also on the way, incorporating intelligence at the terminals at the exchange.

Euronet will be fully operational this year and already it has begun to fulfil its purpose of stimulating the European online information industry. Other communications services such as worldwide satellite to rooftop networks are likely to stimulate industries and services as yet unforeseen.

DK

OPERATORS have not been overlooked. In this week's Op Spot, Bernard Allen looks back 10 years and draws a moral for the next decade. This and more topics of interest to operators appear on page 8.

Great potential

WHEN computers arrived 30 years ago there were intelligent informed individuals (who should have known better) who confidently predicted that computers would never be used for commercial data processing. The reality has proved to be

Small systems

dramatically different. The last 20 years have seen virtually every major commercial organisation adopt mainframe computing in a big way, while the last decade has been characterised by the proliferation of small systems in the £20,000 to £100,000 price bracket which offer a price/performance many times better than the "electronic brains" of the 1950s.

As hardware costs continue to fall, suppliers will be able to offer their customers a lot more for the same price, so the potential business in the 1980s is probably even greater than it has been over the last 10 years. But the success, survival or failure of any supplier of small commercial systems will depend increasingly on whether its software is sufficiently "user-friendly." Ease of programming will be particularly critical as good applications become more and more expensive.

On the hardware side some small systems manufacturers have already adopted bit-slice technology in their processor design and the trend is likely to continue because of the low cost and compactness of bit-slice hardware and the flexibility offered by a microprogrammed instruction set.

The introduction in 1979 of 8-inch fixed media Winchester disc drives offering really cheap mass storage could mean the end of the 8-inch floppy disc as anything more than a device for loading and unloading files.

In the area of I/O on small systems the interface provided by the VDU should be improved in the 1980s by facilities like graphics becoming standard, and colour fairly commonplace.

Interesting developments in the early part of the 1980s will be the first installations of IBM's delayed System 38 and the announcement by ICL of replacements for the existing 2903/4 machines.

In the longer term it will be interesting to see how established suppliers of complete end-user systems like IBM and ICL manage to compete with minicomputer specialists like Digital Equipment, Hewlett-Packard and Data General as the mini makers grow to look more and more like end-user commercial system suppliers.

KFJ

Economic nationalism

WHEN the 1960s dissolved into the 1970s, Tehran seemed to be the place to be. Even before the huge oil price rise rocked the world economy, Tehran was turning from a backward Asian capital into a hustling world business centre. It was vibrant, exciting, alive and, despite the poverty in the south of the city, enormously cheerful. If at that time one had been asked to prognosticate about the international outlook and choose a "winner" for the 1970s, there was no reason to look any further than Iran.

Up to a point, one would have been right. Although the Iranian economic revolution contained the seeds of its eventual disaster, up to about 1977 the Shah's dream of turning Iran into the Japan of West Asia seemed to have a fighting chance.

The Iranian revolution underlines the foolhardiness of trying to look a whole decade ahead and try to say anything valid about the state of the international computer world in 1990.

The Seventies have seen the developed countries forging further and further ahead of the Third World and the Eastern

International

Bloc in the development and application of computers. But there are signs that this may not, after all, continue.

Both the Soviet Union and several of the more advanced Third World countries are recognising the dangers of the ever-widening gap, and France is leading the way in offering its assistance and technology to enable countries to develop their own indigenous industries.

Although making brave efforts to strike deals with the Mexicans and the Greeks, Britain seems constantly to be upstaged by France, and of all the technology transfers to Brazil, that between Ferranti and Cobra appears to be the least successful.

Free Third World countries like India, and relatively free ones including several in South-East Asia and a few in Africa, are likely to turn the freely available and even cheaper microprocessor to very good account, and a surge of economic nationalism against multinationals like IBM is likely.

The emergence of Japan as the third computer power after the US and Europe now seems inevitable, but the prospects of much closer collaboration within Europe seem remote.

TRP

Flexibility need

OFFICES are claimed to be the area most ripe for exploitation by the computer, but will the Office of the Future really have arrived by 1990? Had we all better start selling our shares in paper companies? Certainly in concerns that operate like assembly lines now, such as insurance companies, computerisation can work very well; but looking around many small to medium-sized offices one is struck by how flexible any all-embracing office system would have to be.

Few technologists imagine that mechanical understanding of spoken and handwritten

Offices

language will be practically available by the end of the 80s, so there will still be plenty of keyboards and paper around. Even a paperless office will still have lots of paper being sent to it, and will it be worthwhile to scan all of this into a central store no matter how bulky and/or trivial? An uneasy co-existence between paper and electronic information will certainly be a major aspect of 1990.

One logical and welcome change would be the replacement of all mechanical and electromechanical typewriters by word processors. This would seem a sure thing, considering the overwhelming triumph of electronic calculators over their predecessors. There is one essential difference though — the need for a hard-copy output device, which must inevitably be mechanical and therefore of significant cost. Even though electronically driven printers have far fewer moving parts than typewriters, they must be more robust because, as they are automatic, users are always tempted to hammer them.

This problem of how to turn electrical signals into marks on paper cheaply and with cheap equipment continues to plague the research departments of the big corporations. In the absence of a revolutionary invention along lines no-one has yet envisaged, the "Model T Ford" word processor will be a long time coming.

There should be by 1990 a curious dichotomy between the big companies with all-singing-and-dancing Offices of the Future and small offices piled with paper (produced by the ever more efficient machines in the big firms) in which Bob Cratchit would not feel all that much out of place.

RJ

FOCUS

A non-year for many, then murk

LOOKING through the crystal ball darkly, I confidently forecast a bumper year ahead for much of the DP industry. On the micro scene, Old Moore Focus can reveal that 1980 will see more articles published, more conferences and exhibitions staged and yet more public discussion. Whether the public will be any the wiser at the end of the year is, however, doubtful.

A similar fate could befall office automation. A bevy of reports will suggest that on the one hand the electronic office will be a boon to all mankind. Grotty office routines will disappear to be replaced by cost effective efficiency. For the executive, files and records will be available at the touch of a light pen. On the other hand, rival reports will suggest that the dishy blonde secretary will disappear along with most of her colleagues. Only highly qualified technicians will be able to mastermind electronic filing systems — provided, of course, there are no power cuts.

Nearer home, I can reveal that IBM's long expected H-series announcement will be made. Among all the excitement, the company will casually mention that delivery dates are scheduled for the year after next — and that the backlog of orders is in the region of 10,000. The PCM companies will immediately complain that IBM is not matching their technology timescales.

According to the omens, 1980 will be a non-year for many. Prime non-year candidates include privacy legislation. The government will be more concerned with radiation leaks than data leaks. Similarly a bleak year is in sight for the leasing companies — those that survived the 1979 holocaust will be more occupied issuing writs and law suits than issuing new leasing agreements.

Other non-event forecasts include the NCC and CSA — both under new management so they will need ample time to get established. As far as the twin representatives of the industry are concerned the BCS will continue to identify itself with the academic needs of its members, while the IDPM will be more concerned with recruitment and general expansion than in conveying the views of the DP professional to the boardroom and government.

It will, however, be far from a non-year for DP staff. The present acute shortage of personnel can be expected to intensify. As a result, DP teams can look forward to a year of plentiful opportunities.

While in the installation area, I see problems looming in respect of the Equal Opportunity Movement. Currently, the place of women in computing is limited to input, operating and programming routines. By custom the data processing manager person is a man, as are most senior analysts, engineers and user department managers. This year may well see the female element saying, "Enough is enough." A larger share in the DP action is required.

The more chauvinistic DPM, however, would gently ask how a female DPM would respond to being taken out by the sales manager (male) to the Playboy Club or captaining the installation's darts and football teams.

Beyond 1980, the crystal ball turns decidedly murky. Forecasting this year's Computastars winner is more easy than determining future technological trends and developments. But whatever happens, the role of the DPM looks like becoming ever more complex. Distributing data may well be the forecast mode. But seldom are DPMs' responsibilities distributed — or diluted. Meanwhile, A Happy Data Processing Year to all.

Downtime

by Chad

There's one born every minute

SOME time ago in the States there was a story about a new twist in computer crime. Instead of prising into someone else's computer, the crook was using a machine of his own to organise his dirty deeds.

His scheme was to send out thousands of invoices to randomly selected firms around the country. These bills were for totally non-existent goods that were never supplied.

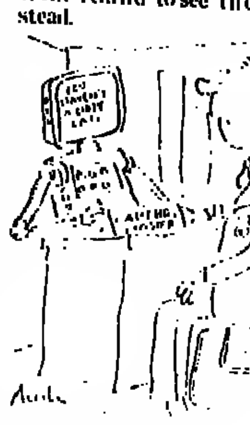
Most of the time the firms would return them saying "What the blazes is all this about?" and he would reply "Oh dear, mistake, terribly sorry" — and that would be the end of it.

However, a good many companies would actually pay the bills, and from this the bloke was making a tidy income until the Feds caught up with him.

He used a home computer to make sure he never tried it on with the same firm twice. Typical Yankee ingenuity. And only Americans could be so stupid as to pay any old invoice without checking it, right?

Wrong. Bunzl Telecommunications Services, which provides equipment to monitor telephone usage, sent out an advertising leaflet recently to point out the dangers of large unitemised phone bills and the uncontrollable costs they represented. The leaflet included an imitation phone bill for £6,815, and the comment, "Wouldn't it be silly to pay this bill, and wouldn't you like to try our services?"

Lo and behold, one large firm in the City did pay it. They sent a cheque for £6,815 to Bunzl, which returned it and went round to see them instead.



Go forth and multiply

I'M getting a bit worried about all these small businesses that are falling over each other to buy microcomputers. After all small businesses are Our Hope for Future Prosperity — so the Blessed Margaret and Sir Keith tell us. One I have heard of bought a machine complete with a suite of programs from a systems house almost a year ago (Remember how good our systems houses are, so we are told?). The firm started up their equipment, and it didn't work. It still doesn't.

An example of this is the order entry program. By some magical process on output every quantity or value gets multiplied by the line number. Thus line 28, one unit, value £1,000, ends up as 28 units value £28,000, but only on the invoices and packing notes, not on the screen.

Ingenious! How on earth do they do it? I'm sure it says a great deal for the cleverness of our software, but I fear it won't do much for the balance of payments, unless it gets our overseas customers to pay their bills 28-fold.

Career for Shah

"SHAH appointed tape-product specialist at Kennedy" read the announcement from a US peripherals manufacturer.

How interesting! After we all thought he had gone to Panama! Mind you, he has been complaining in magazine articles that he is running out of money. A new career in our booming business would seem an attractive step for a deposed monarch looking for a promising future.

It's pretty courageous of the firm, though, to recruit such a controversial figure, even considering how hard it is to get staff.

However, it turns out that the person in question is one Mr Prem Shah, no relation. I'm sure the Ayatollah's assassins were looking forward to a free trip to Disneyland.

MICHIE'S PRIVATEVIEW

Lions led by donkeys in the 1980s?

THE start of a New Year, which is also the start of a new decade, invites expression of cherished hopes for the future. Mine is a simple one. I pray that scientific and technological literacy be allowed to percolate into government departments.

I recently received a very strange letter from an official of the National Computing Centre. The letter retailed, in the Whitehall equivalent of Billingsgate, reasons found for not coming across with the cash for a 7,000-word article earlier commissioned under the Microprocessor Awareness Project on the subject of The Medical Potential of Microelectronics.

The punch line was that if the topic of expert systems in medicine (one of the article's six selected application areas) was to be included at all, then the article "should state clearly that the practical applications of the ideas are far in the future."

Such are the words which emanate from persons charged at taxpayers' expense with the task of promoting awareness of new paths in computing. Yet if ever there were a new path glittering with self-evident practical benefit it is the trail currently being blazed by prototype "expert systems" installed in hospitals in the US.

Far in the future? At the Pacific Medical Centre, San Francisco, two such systems are doing routine service. PUFF evaluates the results of tests of pulmonary function and comes up with diagnoses of the nature of respiratory disorders inferable from these. VM handles online monitoring and management of patients who are being maintained on mechanical ventilators ("iron lungs").

Moving eastwards, let us pause at Pittsburgh Medical School. Albert Myers, now in his 60s, is one of the world's acknowledged masters of the diagnostic arts of internal medicine. The expert system INTERNIST built by Harry Pople with his aid will be his enduring monument. Encapsulated in the program is a growing corpus of clinical principles and rules-of-thumb which collectively give effect to Myers' uncanny intuitional skills and richly indexed knowledge. In one area of internal medicine after another INTERNIST outperforms all but Myers himself.

On to the East Coast. We find at Rutgers University, New Jersey, a thriving centre of expert systems work under the artificial intelligence pioneer Saul Amarel. Among several projects, I shall mention just one, dedicated to the differential diagnosis of glaucoma. This system has reached a finished state in which the reliability and consistency of performance is superior to that of specialist clinical ophthalmologists. Moreover, its "thought processes," as is typical of expert systems generally, are pleasantly accessible and transparent to the user. The clinician is thus placed in a good position to criticise or override the system's judgments if he feels so disposed.

It might be said in NCC's defence that public servants, with all the harassments of the daily duties, cannot be expected also to discover America. It took Columbus a great deal of trouble to do this — and he was free of other distractions. Scotland, however, should surely be within the mental horizon of even the most oppressed paper-pusher.

At Bangour Hospital, some 12 miles from Edinburgh, Mr Gunn's surgery department employs de Dombal's system, running on a DEC PDP-11, for the diagnosis of acute abdominal pain. Although not strictly describable by the purist as an "expert system," little additional work would be needed to give it the added self-explanation capabilities of the genre.

In the bad old pre-computer days, house surgeons at Bangour Hospital scored on average about 40 per cent correct diagnosis (ie slightly better than national averages). Gunn himself scores near the 80 per cent mark, and the expert program is not far behind. Since the program's installation, nearly three years ago, a remarkable change has come over the diagnostic skills of the house surgeons. Whether it is a result of the "needling" effect of machine competition, or of clarification of diagnostic rules through familiarity with the program's principles of operation, is not clear. The fact remains that the house surgeons now routinely perform at approximately 60 per cent accuracy.

Let me warn against anyone jumping to the conclusion that I aspire to re-enter the field of medical computing. For ten years or more my besetting interest has been the identification and exploration of overlap areas between robotics and certain aspects of expert systems work. But when one considers that every mis-diagnosis of acute abdominal pain has a fair chance of leading to the death of a human being, then the level of technical literacy to be found among some of our public servants must be regarded as disturbing.

Leaving medicine, consider the findings of the Thomas Malone Committee of inquiry into the Three Mile Island nuclear accident. Lack of just such features as expert systems offer, was found to have been a critical failing of the nuclear reactor's control and fault-monitoring software. US technical agencies are well stoffed with people able to understand such considerations — which would I fear, be quite lost on their opposite numbers over here.

Observers and historians of the 1914-18 war coined the phrase "Lions led by donkeys." Those with responsibility for science, whether academics or administrators, must I believe be ready continually to train and retrain themselves. I personally wrestle with my own numerous areas of painful ignorance — evening study, sitting in on lectures, sitting at the feet of colleagues.

My personal New Year's resolution is to do more of this. Whatever happens, we should all co-operate to ensure that this new decade will not be remembered as the one in which boffins were led by jackasses.

REFERENCE

Michie, D. and Townsend, H.R.A. (1979) The medical potential of microelectronics. Experimental Programming Reports: No. 34, Machine Intelligence Research Unit, University of Edinburgh.

LETTERS to the EDITOR

S Africa—the moral issues

I WAS truly amazed and disappointed that the article on working in South Africa (CW, November 1, 1979) talked only in terms of the money to be made and left out of consideration the moral issues (the rather flippant comment that "there are many arguments about the type of society that at present exists in that country" does not constitute a "balanced view").

South Africa is undoubtedly a country of great beauty which, coupled with the remuneration levels offered, makes the personal conflict of interests from working there all the more great, and discussion all the more important.

Leaving judgments solely to the individual's conscience results only in great financial benefits to those with little conscience. Moral pressures must apply somewhere. If the BCS has not already drawn up a position paper on this issue it is time to start discussion, perhaps through your Letters column.

An industry as clearly influential and important as the computer industry surely cannot declare its intention of keeping out of politics — it is already up to its neck in politics as a result of the power it wields.

I for one, and I am sure many other regular readers, look forward to an editorial devoted to the stance taken by computer firms in relation to the discrimination laws of South Africa.

DAVE HARAN
University Hospital of South Manchester
Department of Social Research
Manchester

Automatic fare collection

MAY I correct some points in your article about automatic fare collection schemes in the US and this country (CW, November 22, 1979)? The general contractor for the first stage of London Transport's automatic fare collection system is Westinghouse Cubic, jointly owned by the Westinghouse Brake and Signal Co. of Chippenham, Wilts, and the Cubic Corp of America.

London Transport has no contractual ties with the Cubic Western Data Corp, which is a wholly-owned subsidiary of the Cubic Corp.

Our contract for the first stage is worth about £4.5 million. The figure of £10 million which you mention is the financial authority for the entire first stage which includes a substantial amount of work by London Transport.

Your description of the planned ticketing system suggests we are proposing a stored fare system. In fact, our system will be based on our present ticketing arrangements using single, return and season tickets.

R. F. DOREY
Development Director (Railways)
London Transport
London

What about MEEP?

I CANNOT let Peter S. Davis' letter (CW, December 6, 1979) pass unnoticed. He comments on the need to multiprogram VME and DME working on 2900. This facility exists under the name MEEP and we at Islington have been running the complete workload of our old 1903T under George III concurrently with VME/B processing for over a year. On an individual terminal it is possible to run either a George 3 MOP service or VME/B MAC service, this choice being that of the programmer, not the software.

If ICL has any difficulties, it is in making products like MEEP known in the market place.

A. G. HOOKER
Computer Services Manager
London Borough of Islington

10 years ago
From Computer Weekly January 1, 1970

CONTROL DATA acquired Precision Data Co. of Toronto, as part of a move to extend its interests from large scientific machines to a broader base . . . London bureau Computime ordered a 360/85, claimed to be the most powerful machine in production in the world . . .

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New work carried out by the systems analysis division of the City University Business School, London, is linked with previously published information to provide methods of optimising the performance of sequential, direct and indexed files. Marked improvements can be achieved, particularly with direct files, which are worthy of wider use than at present.

Students of data processing, lecturers and practitioners should all find the book invaluable, particularly because it provides a great deal of information and many illustrations in a very compact format.

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General Sales Department, IPC Electrical/Electronic Press Ltd., Dorset House, Stamford Street, London SE1 9LU

Plessey drops out of optical memories

AFTER deciding to end all development work on bubble memory devices Plessey Microsystems announces that it has now dropped all its development of optical memories.

Plessey had been working on photochromic mass memories for several years in parallel with the development of a holographic memory system. The latter project was killed last summer (CW, July 26). Plessey has now thrown in the towel on photochromic memory development, an area where IBM is active, and has produced a system where a laser changes the chemical nature of photoreactive material at different frequencies.

Plessey Microsystems at Towcester is now concentrating on the development of memory systems employing semiconductor and bubble devices bought in from other manufacturers. Rockwell is the major source of bubble devices at the moment (CW, December 6, 1979).

Plessey is currently designing semiconductor systems employing 64K-bit RAMs, although the company does not believe they will become cost effective in comparison with systems based on 16K devices until the middle of next year. Plessey is working with the Hitachi 64K device.

City wakes up to software industry

THE favourable eye which the financial community is at last turning on the UK software and services industry has now lighted upon Logica. The £2 million of institutional money that has been invested in the group (CW, December 20/27, 1979) could point the way for more backing for other established companies in the industry.

One of the first indications of this change of heart was the £400,000 boost given to Gamma Associates last November (CW, November 8, 1979), and now Planning Research Corp, the US company that had originally backed Logica, has bought Gamma (see front page).

Commenting on the change in the City's attitude, Logica chairman Philip Hughes said that when he and his co-founders set up the group 10 years ago they had to go to the States for the necessary support. Even two years ago the situation was the same but now the services industry has become a "sexy" item, he said.

The new investors now hold 24.5% of Logica Holdings with the remainder of the shares divided between the National Enterprise Board holding 20.8%, and Logica Securities, the staff shareholders' company, holding 54.7%. The NEB also holds 20% of Logica Securities giving it a total holding in Logica of over 30%.

For the year to the end of June, 1979, Logica achieved a turnover of over £12 million with pre-tax profits of £1.2 million and net profits of £430,000.

Reporting on the progress of the marketing project for Prestel International, which Logica is handling on behalf of the Post Office (CW, August 30, 1979) Hughes said that tests were due to start within the next few months. In addition to the UK, countries taking part are the US, West Germany, Sweden, Switzerland, Holland and Australia.

One of the Post Office GEC 4048s has been allocated for the initial operation of the service and between 10 and 20 information providers are producing a database for international users. It is expected that up to 300 terminals will be installed in time for the start of the test service.

Micro Focus in US

A NEW operating company in the US has been formed by Micro Focus, writers of the CIS-Cobol compiler for microcomputer systems. It will be based in Santa Clara, California, close to such companies as Intel, which sells CIS-Cobol as a software product.

Showing a commendable interest in computers and demonstrating how to power down a cartridge disc drive without looking, Miss South Africa, Karen Sickel, sets off to perfection the stylish lines of the new Perkin-Elmer 3240. The powerful 32-bit general-purpose minicomputer has just arrived on the South African market, courtesy of Protea Computers. Protea general manager Ash Emery is grinning for more reasons than meet the eye: the smaller Perkin-Elmer 3220 was launched in South Africa in October, and by December had chalked up orders worth two million Rand, about £1.25 million.

Japanese move in on Josephson technology

ALTHOUGH IBM has made all the running with Josephson Junctions so far, announcing that it hopes to have a prototype 70 million instruction per second Josephson supercomputer working by 1984, it will not have the field entirely to itself. Nippon Telephone and Telegraph, the Japanese public telephone company, announces that it has developed a new element which uses the Josephson effect out of a Niobium-Germanium compound, an area also studied by Univac. IBM is using lead-based technology.

NTT appears to be thinking of using liquid hydrogen rather than liquid helium as a coolant, suggesting that a much smaller and less power hungry refrigerator would be needed; it also suggests that its elements super-conduct at about 253° Centigrade below zero, compared with —260° for the IBM elements. Absolute Zero is approximately —273°.

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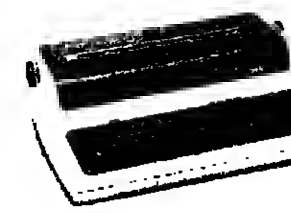

DIGITAL LA34 DECWRITER IV
The LA34 is a 300 baud, 30 cps desk-top terminal that can print at burst speeds up to 45 characters per second or an alternate speed of 110 baud and 10 cps can be selected from the keyboard. Clear character printing through a 9 x 7 dot matrix impact printhead produces the full upper and lower case 128 character ASCII set. Other features include variable character sizes and adjustable line spacing.
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TEXAS INSTRUMENTS 745 PORTABLE
The 745 is an 80 column, thermal printing terminal with a built in acoustic coupler and EIA interface. The quiet operating 5 x 7 dot matrix print head prints at operator selectable speeds of 10 and 30 characters per second. Standard ASCII keyboard with calculator-type embedded numeric keypad and two key roll-over feature. Complete with its briefcase-like carrying case the 745 weighs only 13.5 pounds.
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TECHTRAN 951EE MICRO-DISC UNIT
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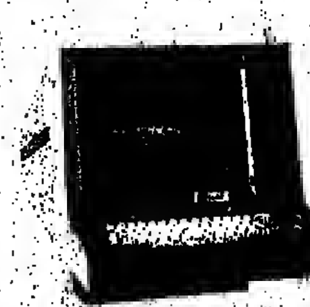

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PAGE SIX for programmers and analysts

Cobol...a time for change

"Cobol has outlasted its usefulness as an innovative tool; it now seems to be used as a comforter for programmers afraid of the dark," says Ian Clark, our guest writer this week on Page Six. This article aims to refute the claim that Cobol is powerful and readable and examines some of the established myths of the language, comparing it where necessary to PL/I.

Clark has worked in computing for the past 15 years moving from IBM to specialisation in the oil industry and now works for McDermott in Dubai.

IN the beginning was the word, and the word was a mnemonic. Programmers worked in assembly languages.

In 1954 came Fortran, designed for scientists to solve their problems in a language suited to expressing these solutions without recourse to the mental exactitudes required in low-level language programming. The attention of the programming community was concentrated on arranging data around a central algorithm to solve a specific problem.

Programs tended to be small and relied on auxiliary storage, often tape, to hold intermediate results for later processing. Anything larger was accomplished by overlays, and programmers had to think less in elegant, natural solutions to a given problem, but more in terms of machine and device efficiency.

Horizons were limited. Concern was to solve the problem at hand rather than to attempt to understand the interaction of data and program structure. To have done so would have been like da Vinci's aeroplane design — too far ahead of the technology.

That was the state of art in the Fifties. It was at that time Codasyl was created to respond to the needs of the business community to design a language suited for expressing their particular needs. Cobol was the result.

This initial version was extended to include report writer and SORT (1962), then again to include mass-storage I/O and table-handling (1965). Cobol met many of the business requirements of the day. Its structure was intended, by use of divisions, to provide a standard pattern for documentation and the use of its English-like syntax to make programs self-documenting and readable to non-programmers.

Since that time computing power has multiplied to such an extent that problems are now tackled which before were beyond consideration. Many non-programming users now are able to tap this power by means of packages and very high-level interactive query-languages. Programming is beginning to grow up. Languages and methodologies reflect the complexity of the systems attempted and the support given to the non-programming computer user.

Cobol has been successful primarily because of its ease of use, documentation and transferability, although it does not have the power of later, more generalised languages. The following paragraphs examine Cobol from the point of view of structure and readability, ease of use, power and unconvenience.

Only details are examined, conclusions are left to the reader. The only point which cannot be shown is that of program size. Syntactic idiosyncrasies, restrictions in expression or structure may register as a minor nuisance individually but have an exponential effect on the readability of a large program.

The power of a language is measured by the conciseness and naturalness in which a problem can be unambiguously stated. The converse of this is also true that the syntactic and structural restrictions of a language may limit the thought of the problem solver.

Too great a restriction in language expression, however, leads to contrived solutions. The following contrivances which apply especially to Cobol have been solved by designers of later languages.

Reserved words. Cobol's reserved words have always created a problem, not only to the applications programmer writing a new program, but also especially when extensions to the language are required. The new construction, table-handling (1965), or list-processing (Codasyl proposal 1971) unfortunately create new reserved words to express the new "tacked-on" concept. This makes all previously written programs suspect; they may well have used the newly forbidden words.

Data types. Cobol allows only variables whose structure is known at compile time.

Cobol also dis-allows bit strings, floating point and control variables.

Data structures and operations. Cobol supports two only of the five types of data structure currently available: arrays and record structures. String, stack and list operations are inexpressible. Of the supported structures, array operations are not very concise.

A Cobol array cannot have variable bounds, neither can the lower-bound of an array be associated with a subscript value other than that of 1.

No array operations are available. To increase the contents of each array position by one (whatever its dimensions) — the PL/I statement

ARRAY = ARRAY + 1;

has no Cobol equivalent. Cobol requires an iterative process to be explicitly stated either using PERFORM or GOTOs — each method being verbose and lacking readability.

Declaration and initialisation of Cobol arrays is verbose. Consider the Cobol equivalent of the PL/I statement:

DECLARE ARRAY (3)
CHAR INIT ('A','B','C');

Built-in functions. Built-in functions are inclined in a language definition because they represent an efficient and accurate solution to a frequently-used operation.

Examples of uses of built-in functions, of which, at present, Cobol has none, are:

INDEX — to search a string for a given character or sequence of characters.

ADDR — to return the storage address of a variable.

DATE — to return the current date.

DIAGNOSTICS AND DEBUGGING. The essence of diagnostic power in a language is the ease and conciseness with which it can be used in comparison with the readability and volume of its output. Programmers use these facilities both to create test data and to prove their program is working correctly.

Cobol's execution-time diagnostics are restricted to READY TRACE, EXHIBIT (NAMED) and DISPLAY.

The PL/I statement, for example

PUT DATA.

lists every variable currently existent in the program both identified by name and converted to a readable format. There is no Cobol equivalent.

Programmers can help to ensure readability by following certain general rules. These, to a great extent, are independent of which high-level language is used and are the use of: meaningful names; indentation of condition dependent code; blank lines; comments; or coding only one statement per line.

Readability is also enhanced if the program, or model solution of a real-world process enables the reader to scan the program text from top to bottom and quickly grasp the essentials of what is happening.

The primary and conditional code may be highlighted by indentation and spacing. It is a question of style that many programmers prefer to present a series of subroutine references (CALLS or PERFORMS) at the highest level.

It is in structure and readability that Cobol is lacking. The following arguments illustrate this:

❶ Cobol conditions are delimited by a full stop. Many experienced programmers have been nonplussed at one time or another, by logic errors which later have been found to have been caused by a misplaced full-stop. Finding the problem is difficult mainly because the programmer, on reading the text and looking for a logic error, tends to read what he wants to see, passing over the simple syntactic omission. Recent languages such as Algol or PL/I delimit condition code by more definite and readable END; statements.

❷ In structured programming constructions Cobol has no DO UNTIL. The PERFORM UNTIL in Cobol is actually a "DO WHILE (condition is false)".

"PERFORM (action) UNTIL (condition is true)" implies syntactically, that the action is processed first, then the test for the condition truth is made. In Cobol the test is made first then the action is taken. A small point, but hardly readable without certain mental gymnastics.

❸ Cobol has no CASE statement (the multiway branch, process and single-exit construct). It has instead the GOTO DEPENDING ON — but this depends on other GDTO's to link the processing up to a single-exit again. Failing this, a series of nested "IF THEN ELSE" clauses meet the logic, if not readability requirements. Algol has the CASE OF statement, as does IBM's PL/I.

❹ Cobol has no in-line iteration code (DO REPEAT). Iteration is accomplished by the PERFORM statement which enforces a reader of the program text to visually jump around almost as much as if GOTOs were used. The real use of out-of-line code is to define a common function accessed from different places in the program text. It is a device to ensure accuracy by reducing the amount of coding effort, not a construction existing because of a defect in the language structure.

❺ Cobol's variables are created at the head of the program text in a DATA DIVISION. Although for many purposes this is quite a good convention, there is no opportunity of declaring variables near to the code which is to use them.

Cobol may not be so readable or powerful as one would wish. It has been a useful language in the popularisation of commercial computing. It has the advantages of being well-known and many commercial systems are written in Cobol. So why convert? Are the costs outweighed by the benefits? Some points to recommend the process are listed below.

1. It is a watershed time for computing. If the computing shop shows itself inadequate in supporting the corporate information requirement, line management will opt for department-oriented microcomputers to achieve results. A better solution would be to allow for more powerful information processing facilities (time sharing, database processing) and equally powerful languages to achieve the result).

2. Later developed languages such as PL/I are so much more powerful than Cobol. Text processing, modelling, list-processing, relational calculus, diagnostic aids, array operators, etc, are available; the list is considerable. Also, having no reserved words and a better underlying structure, future expansion of the program capability is available without disruption.

3. The power of the language also affects development speed. Anyone who has taken an age laboriously coding up a Cobol data division and the procedure division with all its noise words to simulate English cannot fail to code quicker using a concise language such as Algol or PL/I.

4. The conversion process involves people rather than programs. The average shelf-life of a program is two years. It cannot be discounted as a maintenance problem but can be minimised by using a language conversion package for the most important programs. Neither is conversion training a major problem for staff already using an existing high-level language. There will be many parallels between one language and another.

5. The indications are also that when programming staff start to use a powerful general-purpose language, they tend to stay longer at the installation. They are more content, more interested in their jobs and no longer regard themselves as a mere adjunct to accounting.

Conversion is a difficult time. And the most difficult time is overcoming the conservative attitudes of not only executives who can take the decision to guide the corporate body in one direction or another but also of programmers who fear change. They (the programmers) used to be innovators, but now, at a time most detrimental to the growth of language facilities to keep pace with hardware advances and user expectations, have opted for familiar things and perhaps mediocrity.

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Puzzler

I TOOK up squash 18 months ago, and entered the lowest of the 25 monthly leagues at my local club. Initial progress was good, but lately it has become very difficult to make further headway.

I have just been promoted to League 13, after several months of fierce combat in 14. This might well be my limit, so naturally I hasten to commemorate the occasion with an appropriate alphametic, as follows:

TERRIBLE +
NUMBER +
THIRTEEN +

Solution — page 29.

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CONFERENCES

A ONE-DAY seminar on electronic funds transfer at point of sale will be held on March 6 at the Cafe Royal, Regent Street, London. Organised by Retail Conferences, the seminar aims to bring managers in retail distribution up to date on the latest developments in this field and to provide a forum for discussion on the problems and benefits seen in the introduction of such systems in the UK. Topics to be covered include systems design, information systems, security and public relations. Details from Retail Conferences, 30 London Road, Westerham, Kent. Tel: Westerham 63188.

The fourth annual data entry management conference is to take place in Orlando, Florida from November 10-14. Papers are invited on all topics related to data entry and distributed processing, word processing and human machine interface. Details from Marilyn Bodek, Data Entry Management Association, PO Box 3231, Stamford, CT 06905.

The first two conferences planned for 1980 by Business Information Techniques are Advanced Word Processing, and The Electronic Manager. The first will take place on January 10-11 at the London Press Centre and the other January 24-25 at the Hotel Russell, London. The seminar covering word processing will discuss the use of microprocessors and losers in multiple copiers, the concept of capturing incoming information on video fiche and interfacing the text with word processing, also the problems of data and word processing being contained within the same machine. The conference to take place later in the month will be exclusively about the behaviour of people coping with change within the office environment. Further information may be obtained from Business Information Techniques, 15 Devonshire Street, Keighley, West Yorkshire. Tel: Keighley 63456.

The Institution of Civil Engineers is holding an informal discussion on computer assisted estimating for the contractor on January 21. The seminar aims to discuss the reasons for choosing computer based systems for assisting the estimating process and explain why these systems have failed to be successful in the UK. Details from the Institute of Civil Engineers, Great George Street, London SW1. Tel: 01-222-7722.

A one-day conference has been organised by the Institute of Purchasing and Supply specifically to help the first end small users of computers and computer equipment. Information will be provided on the various systems used by other small organisations and advice will be given to new and existing computer users. The seminar will take place on January 23 at the Carlton Towers Hotel, Cadogan Place, London. Details from the IPS, IPS House, High Street, Ascot, Berks. Tel: 0990 23711.

The eighth International conference on computational linguistics is to take place in Tokyo from September 28 to October 4, 1980. Papers are invited for presentation at the conference, which will convar discourse, syntax, semantics and the history of linguistics. The deadline for abstracts is January 15, 1980, and they should be sent to the Programme Chairman, Professor D. Hays, 6048 Lake Shore Road, Hamburg, New York, 14075, USA.

A pioneer of the development of purpose designed and printed computer labels, Horace Klafter, is to speak at the third Dolphin Labelling luncheon arranged by Dolphin Labels of Brighton, on January 8, 1980. Details from Dolphin Computer Labels, New England House, New England Street, Brighton, Sussex. Tel: 0273 69136.

SOFTWARE FILE by Claire Gooding

Challenge to the security of CICS

THE recent release by the European Software Company of a system called Secure/CICS seems to suggest that security arrangements for IBM's Customer Information Control System are not all that they might be. The product aims to prevent the accidental or intentional alteration of information, and make easier the task of ensuring that access to sensitive information is restricted.

CICS makes such resources immediately available to many people at different terminal locations, and according to an ESC spokesman, the security provided by IBM for regulating access is "extremely rudimentary, so little as to be valueless."

ESC claims that Secure/CICS offers protection significantly more comprehensive than that available through existing CICS software. The product is designed to allow many different levels of protection to be defined. The installation can specify its own control elements which will supply a sophisticated level of control over who can access what, and from where, ensuring automatic approval or rejection of an attempt to access to system.

The features, says ESC, enable the protection of individual resources as well as controlling terminal activity.

Although the emphasis is on security, Secure/CICS also features basic elements of good housekeeping. These include remote control of terminals which might have been left on by mistake, or which should only be used at certain times of day, and an automatic audit trail which records details of how data was accessed. Should a significant security violation occur, the security officer is alerted, and is able to reconfigure the security controls immediately, without any disruption to other users.

ESC admits that subversion of the security system would be possible, but not without detection, and as Secure/CICS resides in the operating system, it would take very specialised knowledge to achieve it. "Super-zapping" as the by-passing of security safeguards is called in the US, is recognised danger in computer abuse.

Secure/CICS is presented more as a tool to combat carelessness and unauthorised use of resources rather than the determined criminal, but the area at which it is aimed points to the deficiencies of CICS as it stands.

Recognising its vulnerability, IBM is planning to improve security aspects in release 1.5 of CICS next year.

Circle Computer Consultants is also investigating an Online Software International product called Guardian, as yet unpriced in the UK.

The DS version of Secure has over 250 users in the US and Europe, and Secure/CICS has won 20 US users since its introduction two months ago. It usually costs £10,400 but has an introductory price of £6,720.

More RTL/2 compilers for Eclipse, Nova

TWO more RTL/2 compilers and run-time libraries have been announced by Software Sciences Ltd, for Data General Eclipse and Nova systems under RDOS. The company already markets one of the first RTL/2 compilers for micros using the Texas Instruments 990/10.

The RTL/2 projects have all been backed by the National Computing Centre's Software Products Scheme, which made a grant of £27,000 to support the new products. The Eclipse version of the compiler is available now to UK users, and the Nova version is scheduled for release in January 1980.

SIA offers Pascal service

PASCAL is now available under SIA's remote access computer service, based on CDC Cyber 175 and 6600 machines. SIA now offers the Pascal 6000 compiler, first developed at Zurich and enhanced at the University of Minnesota by Nicholas Wirth.

Clients are able to develop their own program via a terminal into the SIANET local access network. Full technical support and documentation is provided.

SIA says that Pascal has been found to require much less memory than any other high level language.

Interface for Datamanager

THE data dictionary system Datamanager is now able to run under four TP systems with the announcement of an IMS/DC interface from MSP. Datamanager is already available under CICS, Roscoe and Com-plete, as well as running online under several other systems.

Datamanager under IMS/DC is handled through a series of pre-formatted screens which are designed to simplify the entry of definitions and minimise errors, partly by reducing the typing involved.

Investigation

THE National Computing Centre is to investigate the types of software security systems currently available. Areas to be covered include in-built checks such as passwords, activity logging, code comparison and file interrogation.

Those interested should contact John Pritchard of the Privacy and Security Division, Manchester.

Compudata changes COS/1 marketing strategy

COMPUDATA Systems Inc of Westport, Connecticut, has changed the marketing strategy for its main IBM-Series 1 software product, the COS/1 operating system. Until now Compudata has tried to sell COS/1 as an alternative to IBM's own Series I operating systems. Now the firm will concentrate on selling the enhancements in COS/1 to IBM's own CPS.

COS/1 is a development of CPS and involves less overhead than IBM's RPS. It comes with an Ansi Cobol compiler.

Paul Matroni, boss of Compudata, told Computer Weekly that he had come to the conclusion that IBM users felt "more comfortable" with IBM's own operating software, although he described IBM's third Series I operating system, EDX, as "quick and dirty".

CDS/1 was blamed by Gamma Associates for the failure of the Series 1 marketing operation that it set up in mid-1978 with COS/1 as the spearhead of its sales offensive (CW, June 20, 1979).

Mastroni said he was now looking for a new agent in the UK. He agreed with the general view that Series I had not really taken off yet in Europe (Software File, December 20/27).

Rank Xerox standardises on finance

RANK XEROX, the office equipment and photocopy supplier, is to standardise its fixed asset accounting throughout Europe, Australasia and Africa with a software package from Management Science America.

The package will be used for the usual range of fixed assets as well as the huge numbers of revenue-producing photocopiers which are rented out to customers.

In each of the 22 countries where it is to be installed the software will comply with national reporting requirements as well as the those imposed by US regulations.

The MSA package was officially launched in the UK last September. It is available on IBM, Burroughs, Honeywell and other kit, and is used by over 200 organisations in the US, where it has been available since 1976.

Ten countries have say in future of online retrieval service

USERS from 10 European countries are to have a say in the future of the Lockheed Dialog online retrieval service. The 15-member board will solicit views on the Dialog service from its 3,000 European customers and seek suggestions for additions to its databases.

Dialog holds over 100 databases of worldwide information, providing instant access to over 30 million references to material published over the last nine years on science, technology, the humanities and economics.

Many of the databases are kept up to date by European authorities such as the Institution of Electrical Engineers in Britain, Excerpta Medica in Holland and the Food and Agricultural Organisation in Italy.

Dialog's records are kept on two IBM 370s at Palo Alto, California. They can be accessed from anywhere in the world through keyboard terminals linked to telephone lines.

Users are now able to place orders for the full text of reports to be sent to them. Such orders, made while online to the service, are immediately relayed to the appropriate supplier in Britain, West Germany or the US, who will in turn quickly despatch the complete copies required.

Hotreader

AN internal reader for VS1 systems allowing jobs to be submitted from within other jobs, has been released by Software Module Marketing of Sacramento, California. The firm says that the product, called Hotreader, offers a dependent job scheduling facility which will greatly reduce operator error.

UKS has Centronics 6000 Series Line Printers EX-STOCK

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For further information contact Stuart Allison at the address below:—

UKS Cable & Wireless UK Services Ltd
83 Blackfriars Road, London SE1 8HA. Tel: 01-928 0261. Telex: 916463

OP SPOT

by Bernard Allen

Three-point plan to sicken staff

SALARY, training and career prospects — these are three ways in which the enlightened DP manager can provide incentives and so get the best out of his operations staff.

Bearing that in mind, the manner in which certain installations treat their operations staff never ceases to annoy and amaze me.

Consider the comments of one disillusioned operator. A former TOPS operations student, he writes.

"In the 18 months I have been at the installation I have had about 20 minutes' 'training' on macros and about 50 minutes on our new data entry system."

He goes on: "Whenever my colleague and I ask for further training and courses we are told that none are relevant and that our chief operator has no time to train anyone."

It gets worse: "For the past six or seven months we have been asking to spend a little time in data control to get some idea of where our work comes from and goes to.

"On each occasion the operations manager has replied, 'That's a good idea, leave it with me' and has then proceeded to do nothing about the request."

On career progression, he says, "If I stay at this site I can hope, at most, to rise to the dizzy height of chief operator. And that's counting on one or two people falling under a bus or having some other fatal accident."

And finally, on the question of money: "We are currently in the process of salary negotiations and have been offered a really pitiful sum."

The operator hopes that his comments are policed by people who reckon that most operators aren't interested in career progression.

Will the next decade see much more progress?

HAPPY New Year. Happy new decade — we're in the Eighties, as if you didn't know.

This is the time to break out of our bad old ways, turn resolutions into realities, make actions of brave words.

Of course, that seldom happens and it's not going to be any different just because we've moved into a new decade.

The Seventies came and brought us a whole new range of technology, but now they've gone and left the industry with many of its blind spots and prejudices.

You might think that's a bit cynical and pessimistic, and perhaps it is. But it's true of many of the problems facing operations staff today.

To show you what I mean, let's blow the dust and cobwebs away and look at the Computer Weekly issue of January 1, 1970 — 10 years ago almost to the day.

There is no column for operations staff, but the career progression issue is being debated in the letters column.

Operator David Abbot commented, "The attitude towards operators is sickening. They are (treated as) unqualified, uneducated robots, with only average intelligence. They do a thankless task."

Abbot had worked at three sites and had come across a number of operators who had taught themselves programming with little encouragement from the management.

"Three in particular were notably good, on a par with or better than most junior programmers. No small achievement, when you consider they were completely self-taught."

Abbot's letter had been prompted by comments made by a DP manager and former operator.

In the issue of December 11, 1969, the DP manager wrote, "What I fail to understand is why some operators should have such a blind and avid desire to become programmers.

"As a manager of a large installation it is my opinion that an experienced senior operator is of equal value to a programmer with two or more years' experience."

He pointed to the "very wrong assumption" that the natural career path leads "from operating to programming to systems work to management." And so say all of us.

Career progression is still a problem. But at some of the more enlightened sites operators are now being encouraged to move into such areas as technical support, systems programming, and supervisory and operator training roles. TP networks provide another potential outlet for computer room staff.

Closely related to the career progression problem is the scant attention paid at many installations to operator courses and training. An operators' group or union might help but, as we know all too well, there is no such body or organisation.

Operators, of course, still get paid less than programming staff. They still work shifts and receive an allowance which can only be described as inadequate.

So what's going to change over the next 10 years? Well, people who make it their business to predict what the future has in store point to changes in technology and tell us that fewer operators will be required.

We hear predictions about the effects of micros and TP networks, and know all about mass storage systems, fixed disc drives and laser printers. But who really knows?

New technology may well reduce the demand for operations staff but, hopefully, it will also make night work unnecessary — that would be great. The trend away from night work has already started in Germany and the Scandinavian countries.

Finally, I hope that people in the industry will come to realise that the term "operator" is outmoded, and that the role played by most operations staff is more aptly described by the word "technician."

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Mini users have their problems, too

DON'T underestimate the task of people responsible for running the smaller system, the minicomputer.

The mini may not be as big and sophisticated as the mainframe, but it is still capable of giving headaches to the operator and manager alike.

This is the cry of Colin Walters, who is computer manager at Homeworthy Furniture in London.

He comments, "Previous articles have made it quite obvious that mainframe operating systems are much more complicated than my own, but what about a word for the mini user?

"Surely it is the poor old office manager or company accountant, faced with a newly-installed machine, no experienced staff, who needs the most advice."

At Homeworthy Furniture there is a 128K NCR 8250 with four VDUs, a 300 lpm printer and four disc drives — two fixed and two removable.

It runs under IMOS, the interactive multiprogramming operating system, and is operated by Walters and a young female operator. When there is a lot of work on, they "borrow" some office staff to help in the running of the system.

"Some of them are very interested in it. My operator keeps an eye on them to see that they are all right on the system. They use IOCS, the interactive operator control system, which interfaces between the program and the operator and makes things a lot easier."

A former credit controller, he became computer manager soon after the system was installed.

"I've always been interested in computers and when we got one I was glad to take the opportunity and become the manager of it."

Finding an operator for the system was his first big problem. He tried all the non-specialist staff agencies but was unable to find the right type of person. "In the end I trained someone for the job myself. And she's done very well," he says.

Walters belongs to a recently-formed NCR 8200 Series user group which meets in London to enable members to swop advice and experiences. An example of the sort of hint members are able to pick up at group meetings is given by Walters below.

The group's next meeting takes place on January 26, at Credit Control Insurance, 120 Regent Street, London. It starts at 18.00. Colin Walters can be contacted on 01-807 1040.

No need to tear your hair if system fails

"DO fellow NCR 8200 Series users know that they can generate the system files on to the second fixed disc, if they have one, or even on to a removable disc?" asks Colin Walters.

"This is done by changing the sysgen parameter file in the SYSGEN utility, giving the replacement disk volume serial number and platter number instead of the standard "999999,0".

"A back-up system all together with the appropriate LOAD OS cassette, can be a great asset should your system go down.

"No tearing your hair out while waiting for replacement parts to arrive just load the spare, LOAD OS cassette and use the rest of the system normally."

Film explores the challenge of telecoms

A 25-MINUTE colour documentary which dramatises the evolution of and potential future developments in telecommunications has been produced by Standard Telephones and Cables.

Called The Challenge of Choice, the film uses scenes of Alexander Graham Bell inventing the telephone in the last century, and its present-day use in defence applications to underline the importance of telecommunications technology to all.

STC hopes that its "soft-sell" approach will give the film a wider audience, and discussions have taken place with the Central Office of Information on overseas distribution.

● Our picture shows actor David Ashford as Alexander Graham Bell.

Word processing software with Diablo 3000

A LITTLE sister of Diablo's Ranger 3200 small business system, called the Diablo 3000, has been launched in the UK by Business Computers (Systems) which holds exclusive distribution rights here from the US makers. Incorporating twin 8in floppy disc drives in the same housing as the screen, the Diablo 3000 has a word processing software package of a sophistication unusual in small business systems.

The 3000's daisy-wheel printer is carried on a separate trolley, but everything else is inside the screen housing. The price of £8,950 includes all the usual business applications packages, but word processing software costs an extra £250 a year. The larger Ranger 3200 is priced at £10,600.

Word processing features include page rollover, indented paragraphs, and automatic insertion of names and addresses in letters. Since there are few special function keys, many operations have to be carried out by pressing Control followed by a letter, which the operator has to remember.

Up to two more screens can be added to the basic system.

Diablo is owned by Xerox and these machines will be competing against the Xerox 850 word processor. Business Computers (Systems) is the former bankrupt BCL reconstituted, now acting only as a distributor and systems house, having handed over the manufacture of the Molecular minicomputer to Allied Business Systems.

Fiche inquiries

AFTER trials which began 10 years ago (CW, December 4, 1969) the Post Office is to install microfiche readers in 260 directory inquiry centres for use by 4,500 directory operators. The scheme is expected to cost about £3 million.

'Privacy audit will not prevent misuse of data' says NCC study

AUDITING of firms' compliance with data protection laws can only prod the unenthusiastic into making an effort, rather than catch those deliberately misusing data. That is the main conclusion of a study on privacy auditing carried out by the National Computing Centre for the EEC (CW, January 25, 1979).

Five other privacy topics have also been investigated for the EEC by the NCC's counterparts in other member countries. The English version of all six reports is being edited by Hugh Pitcher of the NCC and is due for publication on February 1.

The topic that has proved most thorny is whether organisations ("legal persons") should have rights of privacy in addition to individuals, as they already do in some countries. This allows firms to force their competitors to divulge what they know about them. One-man businesses pose a particular difficulty.

The investigators found the problems so complicated that they did not attempt to recommend firmly what should be done, but simply reported on what a mess the issue is.

A similar lack of clear-cut solutions came out of some of the other four studies, which were: The quality and quantity of cross-border data flows, methods of working of data protection authorities, international economic aspects, and the individual's right of access. Practical problems loom large, and it is felt that implementation of many privacy provisions would be difficult.

● A British MP, John Butcher (Con, Coventry SW) hopes to introduce his own Data Protection Bill in the unlikely event of his winning the Private Members' ballot in mid-January. He is worried that international firms in the UK will encounter difficulties with their communications if the UK does not go along with other countries' data controls. He is also concerned that overreaction to privacy worries will place the DP industry under an undue burden. The provision for privacy for legal persons in the Council of Europe draft privacy convention would cause "anarchy in business," he said. The Council, however, does not have power to make binding rules.

'Disabled often make better workers' BCS group told

"THE disabled, who are competing in the job market with the able-bodied, often prove better workers," said Tony Aston, of the RNIB, speaking at a meeting of the British Computer Society Committee for the Disabled at BCS headquarters in London.

"Intellectually they can be as good as the next, or better; they are motivated to acquire all the skills they need, to a high standard; and the equipment and services available to them nowadays mean that many of them can compete on equal terms with anyone," said Aston.

The informal meeting, funded by ICL, had been arranged to give employers a chance of meeting members of the committee and discussing with them ways of taking on disabled employees. The employers' aids were well represented and included, among many others, people from Plessey Management Services, ICL, IBM, BP, the Midland Bank and Ariteh Leyland subsidiary BL Systems.

IBM demonstrated its audio typing unit, which is suitable for use by blind people, and Talesensory Systems its Optacon, a device which enables the blind to read ordinary print.

$24 million US defence deal

THE Californian firm System Development Corp, which specialises in the supply of information processing systems, has won a contract worth $24.4 million for the fourth generation advanced computer system. SDC is to provide two Cray-1 computers and support services for the US Air Force Weapons Laboratory at Kirtland, New Mexico.

The contract involves research on future weapons systems vital to air defence.

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WEDNESDAY, 30 JANUARY
Chairman Dr. Frank Taylor, Systems Technology Consultants

DEVELOPMENTS IN MICROTECHNOLOGY
Microcomputing into the 80's.
Dr. Martin Healey, University College, Cardiff.
A review of the microelectronics field with particular reference to the direction the market will take in the 80s.
The developing chip.
Scott Dixon, Intel Corporation.
The trend towards incorporating more elements, including memory, on the chip continues.
Bit-slice technology — An approach to bespoke microprocessors.
Dr. Alan Clements, Teesside Polytechnic.
The flexibility of bit-slice components enables machines with a variety of architecture to be constructed.
Memories for microsystems.
David Parratt, Texas Instruments.
The capacity of semiconductor memory is expanding to meet the future needs and new applications are being opened up by bubble memory.
PUTTING MICROS TO WORK
Vibration Monitoring.
Ian Whitworth, Royal Military College of Science.
Microprocessors are being used to monitor vibration fatigue on large metal structures.
Micros in toys.
Richard Phipps, Texas Instruments.
Growing use of microprocessors in toys poses interesting problems in system design and cost control.
The application of microprocessors in measurement systems.
Speaker from SIRA Institute to be confirmed.
Incorporating micros in OEM products.
S. Sambell, Hugh Pushman Associates.
The technical and practical considerations of incorporating micros in OEM products are examined.

THURSDAY, 31 JANUARY
Chairman Dr. Martin Healey, University College, Cardiff.
SYSTEMS DESIGN AND SPECIFICATION
Specifying the system.
Dr. Keith Baker, Sussex University.
A methodical approach to systems specification and design is the key to avoiding later problems.
Communicating with the outside world.
A.A. Molinari, Data Translation Inc.
Interfacing the microsystem to the outside world is not always as straightforward as it could be.
Five years' experience of a modular system.
Harrogot Lindmarsk, Setico AB.
Description of a microcomputer system based on over 80 Eurocard modules, allowing a choice of processor, store type and I/O circuits.
Standards for microsystems.
Speaker to be confirmed.
What technical standards have been agreed in the micro field? The speaker reviews what has been achieved.
SOFTWARE FOR MICROSYSTEMS.
Micro software.
John Smart, CAP Microsoft.
Microcomputer software is often limited in its scope. But it is improving. The current situation is examined.
Development aids.
K. Smith, Electrical Research Association.
The aids which are available for developing microsystems are reviewed and the way in which they are used is examined.
Development software for microprocessor systems.
Martin Whitbread, Leeds Polytechnic.
The main pre-requisites for development software outlined and the relative merits of PLM and PASCAL are assessed.
Databases on microsystems.
Tony Stock, D.M. England and Partners.
Problems of implementing database applications on microcomputer systems are identified and solutions are described.

FRIDAY, 1 FEBRUARY
Chairman Julian Allason, ACT Petsoft.

PERSONAL COMPUTING
Trends in personal computing.
Robin Bradbeer, North London Polytechnic.
An examination of the directions which personal computing is taking, with reference to the U.S. scene.
How to choose a microcomputer system.
Martin Collins, Applied Systems Techniques.
Identifying the criteria for selecting a microcomputer is the first step in a successful choice.
Where next with the Pet?
Richard Petersen.
What is likely to be the next stage in the development of the Pet and what does the future hold for many thousands of UK users?
How to run a business on a microsystem.
Speaker to be confirmed.
The speaker's experience in applying a micro to his business is described.
Linking your micro to the viewdata system.
Peter Sommer.
The ability to provide local intelligence, in the form of a micro, adds a new dimension to viewdata systems.
Microelectronics in schools — are we going in the wrong direction?
John Severn — Nottingdale Technology Centre.
The speaker argues that we are in danger of regarding micros just as an educational aid rather than tools to be used.
Personal computing — a user's view.
Barry Biddles.
Getting into personal computers is not without its problems. The speaker looks at the current situation and asks whether things are improving.
Personal computing — a retailer's view.
Derek Moon, Currys.
When a major High Street chain goes into the personal computer business it's news. A director of Currys gives his view of the market.

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PEOPLE and EVENTS

One of the top women in business

CHAIRMAN and founder of F International, Steve Shirley, was the first woman in computing to reach the finals of the Business Woman of the Year Award. The award is sponsored by The Times and Veuve Clicquot Champagne and at a presentation held in The Times boardroom Mrs Shirley received a silver replica of a wine tasting cup used by the founder of the Champagne company over 200 years ago and a bottle of special vintage Champagne.

The award, now in its seventh year, is an accolade to women who have reached the top in British business. Initially it was given to women who had reached success in industries which were traditionally male preserves, but with the increasing number of women in responsible positions there is no longer any surprise at finding them holding key roles in business management.

Steve Shirley formed F International in 1962 after graduating from London University and working for a period with ICT, now ICL. The company provides consultancy, analysis programming and management advice to a regular clientele of central and local government, banks and other organisations.

One of the newest ideas to be taken up by F International is the concept of a husband and wife working together as a single work unit.

Steve Shirley was one of five finalists. The winner of the award was Ann Burdus, chairman of McCann and Company.

● In our picture, Mrs Shirley receives her prize from Count Alain de Vogüé, managing director of Veuve Clicquot Champagne.

Gill Ringland to leave Inmos

GILL RINGLAND is leaving the NEB-backed semiconductor compsny, Inmos, where she was head of software, to set up a European software development facility for Modcomp.

She moves to the company's UK base at Wokingham at the end of this year to become software development manager. Her work at Inmos will now be split between Joe Norman, in charge of project control, and Colin Whitby-Strevens of computer aided design.

"Inmos is in good shape now," she said. "It has a good team. It should be — I recruited them!"

John Gilsson has become sales manager for Scotland with Johnson Control System, based at Cumbernauld. He has been with the company since 1974 and was previously sales manager of its London branch.

Rod Atwool has become marketing director for the Northern European semiconductor division of Texas Instruments.

David Palmer has been appointed financial accountant for Darley Business Forms. He was previously financial accountant for Crittall Windows.

Helen Wilkinson has been promoted to sales executive with Prime Computer. She has joined the company's Maidenhead office where she will work for the government branch with particular reference to the Ministry of Defence. She came from Prime International where she was support consultant for the company's subsidiaries in Europe, the Middle East and Africa.

Mike Tsrtelin has been appointed to head a new department for project management at Menzies Communications Systems. He formerly worked for British Airways on the technical support side of their communications systems.

Carl Laut, development director at Sherwood Computer Centre has taken on the additional board responsibility for administration within the group. Richard Guy, director in charge of batch computer services for insurance companies also becomes company secretary for all group companies with the exception of Sherwood Insurance Administered Services (SIAS). Keith Mara is now company secretary for SIAS.

Stewart Pearson has joined System Industries (Europe) as a senior field engineer from Cray Research where he was an associate engineer. Peter Packham has also been appointed as a senior research engineer. He returns from secondment in the US where he was a training officer.

Peter Sturgess has been appointed manager of ASI, the video training company, replacing John Kirkham who has moved to the American parent company as senior vice-president. Sturgess was previously program products manager with Tesco. Charles Gould, formerly a technical consultant with ASI, has become product development manager.

Richard Foster, formerly a microcomputer consultant with Bleasdale Computer Systems, has joined John Hoskyns as a senior consultant with the new consultancy division.

Bob McLean has became head of the BBC's computer services department, the post he has occupied recently in an acting capacity. He joined the BBC in 1970 as a shift leader in the computer services department, and was appointed computer operations manager before taking charge of the department.

Geoff Emmett and Peter Clark have both become sales executives with Data Design Techniques.

Gill Ringland

Changes for 1980 at Kodak

TO meet the new decade, Kodak has announced internal changes. The company has regrouped two major areas, customer operations and manufacturing operations. Roger Leeks who is director and marketing manager will be responsible for customer operations, the group which will bring together marketing groups, the company's colour processing division at Hemel Hempstead and the three Kodak regional distribution centres at Hemel Hempstead, Manchester and Dublin.

The manufacturing operations group embraces all concerned with manufacturing Kodak sensitised goods and chemicals as well as the company's box and printing department, group supplies and the distribution division. Denis Goodchild will be responsible for the group. He is director and sensitised goods division manager.

DIARY

JANUARY 10
IBM CUA management group. Mount Royal Hotel, London. Tel: 01-551 1643.

JANUARY 16-17
IBM CUA Series 1 group. De Vere Hotel, Coventry. Tel: 01-551 1643.
IBM CUA Local Authorities group. County Hall, Cwmran. Tel: 01-551 1643.

JANUARY 24-25
IBM CUA programming group. Holiday Inn, Liverpool. Tel: 01-551 1643.

FEBRUARY 4
Meeting. BCS Fortran specialist group. Heriot-Watt University, Edinburgh. 10.45. Tel: 0533 854455 ext 165.

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COMPANY NEWS

Fast-growing Digico sets up two wholly owned subsidiaries

THE advent of low-cost components and the accelerating value of mature software has transformed Britain's indigenous minicomputer manufacturers, none more so than Digico.

So small five years ago that few people gave it much chance of surviving into the 1980s, Digico's business is now growing so fast that the company is reorganising and forming two wholly owned subsidiaries.

The sales and manufacturing company continues, and the two new subsidiaries are Digico Maintenance Ltd for hardware support, and Digico Management Services for software support. For the current financial year the target for the sales and manufacturing company is £4 million turnover, with a total of £5 million for the group. This may not sound much when compared with the industry giants like DEC and Data General, but is very creditable when one recalls that it took Digico nearly 10 years to get up to £1 million turnover, and it stuck around that figure for about three years before moving ahead in 1977.

The company has switched its financial year-end from March to September.

The current year's manufacturing and sales business is planned to divide into three. Commercial applications, mainly through distributors, are planned to contribute £2 million of business; scientific, process control and industrial applications should bring in £1 million, with another £1 million coming from overseas.

Digico's minicomputers are marketed in a bewildering array of second-line countries. In the Far East there are distributors in Thailand and Hong Kong, and in the Middle East, in Kuwait and Saudi Arabia. There are also distributors in India and South Africa, while in Europe, Digico computers are marketed in two EEC countries, Eire and Denmark, as well as Norway, Switzerland and Greece.

The company is manufacturing its four-model line of minis at a rate of about 20 a month, and also builds the Digico Regent display, memory boards and interfaces.

The new white hope is the powerful M28 which addresses a formidable maximum main memory of 16 megabytes; it has a processor cycle of 500 nanoseconds, 1.8 times as fast as that of the next model down, the MTS; however it is claimed to be four times as fast in applications involving a large number of disc accesses.

An M28 with 256K-words of main memory, a 300 megabyte and a 40 megabyte disc drive, a 600 lpm printer, tape drive and four terminals costs about £70,000. Without the small disc unit and tape drive the price falls to about £55,000.

Programming is either in a compiled Basic or in assembler, and there is also Video, which is a report generator similar to Filetab.

There is a lot more to supporting other programming languages on a machine than simply writing a compiler; even so, it might be worth Digico's while to commission students at further education establishments to write further compilers. GEC's Cobol compiler is being developed at North Staffordshire Polytechnic.

Continuing his survey of British computer companies TIM PALMER looks at the progress at Digico and GEC. In earlier issues he dealt with Ferranti (CW, November 15, 1979) and Computer Technology (CW, December 13, 1979).

GEC Computers turns up trumps

AFTER many years in the doldrums, GEC Computers is at last beginning to reach for the sky, and will report a turnover exceeding £20 million in the year to April 1980, up from about £12 million the previous year.

The company sells a substantial part of its output to other GEC companies, and the proportion is currently 65% externally and 35% internally. The latter figure was down to 20% last year, with Prestel-associated sales of 4080 systems giving a big boost to the external trade.

The company is now emphasising commercial applications on the new low-cost bit-slice models in the 4000 line, the core-backed 4062 and the 4065, which has semiconductor memory. It is selling primarily through software houses, but plans to develop a commercial end-user marketing operation.

APL is now available on the 4000 series, and the language is being promoted for the ease with which simple programs can be written by people who have had little training, typically managers.

There is also a screen formatting package for non-specialists, and using this with the Total database management system, also now available on the 4000, database implementation is simplified — at a price.

The licence to use Total is between £10,000 and £11,000. A wide range of other languages are now also available on the 4000 series, including RPG II, Basic, BCPL, RTL/2 and the GEC assembler, called Babbage. Cobol and Pascal are almost ready.

The new 4000 series processors are built using the AMD 2901 bit-slice micro, and compatible processors using an even higher level of integration are feasible for the future.

IBM France raises £13m loan

IBM FRANCE has followed its parent company into the money market to raise a loan. The company wants the money for expansion of its French manufacturing facilities and to finance losses.

It is the first time since 1972 that IBM France has issued any debt, and the first time that the company has gone to the European money market and raised a loan not guaranteed by the parent company.

The borrowing is a five-year bond for 120 million francs, about £13,500,000, issued at 99½% and bearing interest of 11¼%.

In the autumn, IBM raised loans totalling $1,500 million on Wall Street in the biggest corporate bond offer yet made in the US (CW, October 11).

COMMENT

FORECASTERS seldom get their long-term predictions right, simply because it is impossible to put together a single scenario which takes account of all the random unexpected events which may or may not happen. Any economist able to say with conviction in 1969 that the world of the 1970s would be dominated by a cartel of oil producing countries, would have had to be a clairvoyant as well.

The best one can say is that when we look back in 1999, we will almost certainly include one or two totally unforeseen factors among the dominant influences on the economic climate of the 1990s.

Nevertheless it is reasonable to suppose that the so-called information revolution will have a significant impact on business and commerce, even if the predicted improvements in office efficiency fail to materialise before the last year or two of the decade. Sad to say, all the mistakes and disasters which beset computer projects in the 1990s and early 1970s look like being repeated in the office environment.

Several of the high flying pioneers of the semiconductor revolution are likely to come to grief in the 1990s because of their dependence on an ever-increasing demand for the particular product lines they produce. Equally there will be amazing success stories on the scale of companies like Digital Equipment, Data General and Wang among the embryonic builders of personal computers — and spectacular disasters too.

For the UK computer industry the most fervent wish must be for a growing awareness among investors that high technology demands high and continuing investment, and that it is worth sacrificing a little jam tomorrow for the honey tree a decade hence.

Thousands of American investors, both individual and institutional, have over the years been delighted at the progress of DEC and Data General, and at the performance of their stock. Many in the UK mourn the fact that we cannot nurture comparable companies.

Yet how many of those who mourn realise that DEC and Data General have never paid a dividend?

COMMUNICATIONS NEWS

FCC allows Western Union to link directly to UK Post Office

THE Federal Communications Commission which regulates telecommunications in the US has made a number of deregulatory moves on the international front, opening up increased competition.

AT&T has been allowed to drop its prohibition of non-voice use of international telephone lines. This means it is now permitted to use an acoustic coupler which had been difficult to prevent, so there had been widespread rule-breaking.

Western Union has been allowed to link directly to foreign PTTs such as the UK Post Office, instead of being required to link to an international carrier in a US city.

The international record carriers themselves such as Western Union International, which is an entirely separate company, are no longer limited to operating through five US cities, but can now set up shop in 21 additional cities. They are also permitted to carry voice traffic for the first time.

Consortium Communications has been operating a store and forward message service for two years. This has been classified as a data processing service and as such was not subject to regulation. It has now been reclassified as a communications service and while it would not previously have been allowed to operate at all under this heading, it has now been given ten days to submit a tariff to the FCC.

Following this decision two more companies, Southern Pacific Communications and International Relay Inc, have applied to operate a service. International Relay wants to link to the UK.

The changes have come because the Federal Communications Commission had decided that non-voice business was generating excessive returns on capital. It chose to allow increased competition in preference to imposing price cuts, and in recognition of the growth of computer communications.

French outlet

INTERLEKT, a Reading-based company which imports data communications equipment from the US, has acquired Interdata of Orsay, near Paris, as an outlet in the French market.

Sharing space on satellite channels

AN international experiment has shown the possibility of many small ground stations contending for shared space on satellite communication channels. This arrangement promises better use of satellite bandwidth, which will be required if proposed rooftop systems are to see widespread service.

In the experiment a link established between four ground stations in the US, the UK and Sweden carried voice, data and facsimile traffic at mixed transmission rates over a single 64,000 bit per second channel on Satnet, the US research satellite packet network.

The set-up was demonstrated at the National Telecommunications conference in Washington DC. Status information from the Satnet monitoring and control centre in Cambridge, Massachusetts, was displayed while the three types of traffic were generated.

Software written at University College London was used to handle the facsimile transmission. Bolt Beranek and Newman of Cambridge, Massachusetts, wrote the speech conferencing software which fed the speech signals into the network.

Xerox's Ethernet to be offered as a product

ETHERNET, Xerox's high-bandwidth network for internal office communications, is to be offered as a product from autumn 1980 after several years of experimental use in laboratories. The first device available for connection to it will be an upgraded version of the 850 screen word processor, called the 860.

Ethernet was devised at the Xerox Palo Alto Research Centre and has been in use there and at other sites including President Carter's office (CW, November 16, 1978). It runs typically at five megabits per second and is noted for the ease with which a range of devices can be attached.

The 860 has the same screen and keyboard as the 850 but a different controller with extra software and a choice of floppy or hard discs. It is intended to broaden the functions of the machine outside word processing, and to this end a Basic interpreter is supplied as standard. Future options will include Records Processing, which allows creating and updating records, moving records between files, adding and updating fields, and carrying out four arithmetic functions.

The 860 will cost $15,300 in the US and at the same time the price of the 850 screen machine will drop from $15,800 to $12,200.

Dealers sue Philips for $20m

PHILIPS, which closed down its computer marketing operations in the US last year, now faces a $20 million law suit brought by 13 former dealers who marketed the small business computers.

The dealers charge Philips with breach of contract, saying agreements, some running through to 1982, were suddenly cancelled.

Philips withdrew its computers, which are mainly made in Germany, from the US market last year, leaving Pertec with a contract to provide support and maintenance to users who had got their machines from Philips' direct sales operations. Dealers arranged support for the machines they sold (CW, November 23, 1978).

In an attempt to get back into the US market, Philips sought to buy up to 45% of Pertec, but its bid was trumped by Triumph-Adler of West Germany, which came out of the battle the victor with full control of the California peripherals manufacturer (November 29, 1979).

Memorex fourth quarter gloom

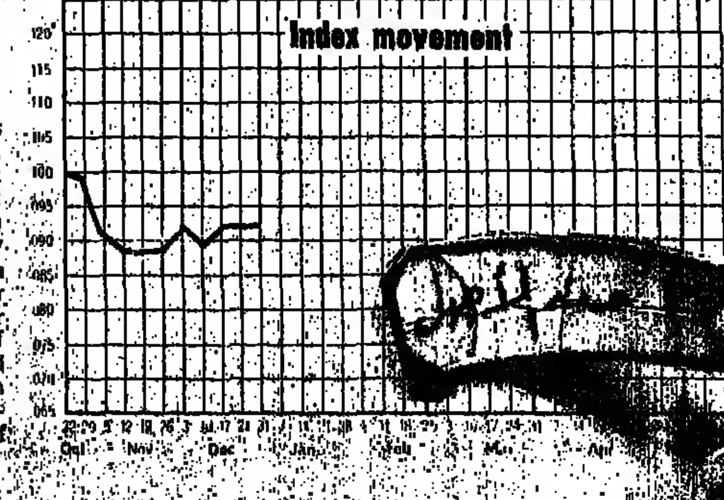
A MONTH after calling off its merger talks with Amdahl, Memorex has announced that stockholders should not expect too much out of its fourth quarter. Last year the company had net profits of $12.4 million for the October-December quarter, and in the third quarter of 1979 it reported a net profit of $7.1 million, but chairman and chief executive Robert Wilson warned that fourth quarter profit would be "less than half" of this.

CW SHARES TABLE

Date 27/12/79 — Index 92.20 — Change +8.08

London Stock Exchange 1979 High (Pence)	Low	Stock	Price (Pence)	Change	New York Stock Exchange 1979 High ($)	Low	Stock	Price ($)	Change
241	168	Applied Comp Tech	240	−1	24½	12¼	AM International	14¾	[illegible]
12	38	Brown Boveri Kent	42	–	20	14¼	Ampex	19½	[illegible]
£38¾	£21¼	Burroughs	[illegible]	−1¼	38¾	28¼	Automatic Data Proc	35¼	[illegible]
183	87	Chloride	12	–	82	64	Burroughs	68	−2
178	88	Chubb	117	−1	19¾	18¼	Computer Sciences	18¾	−1
139	88	Cole	89	–	56	31¾	Control Data	54¾	[illegible]
867	278	De La Rue	548	+10	[illegible]	88¾	Digital Equipment	[illegible]	−1¾
147	81	EMI	130	–	[illegible]	21¾	Harris	33¾	[illegible]
200	134	Extel	152	+2	80¾	42¾	Hewlett-Packard	58¾	−1
430	320	Ferranti	408	+38	84¾	61	Honeywell	82¾	−2
438	317	GEC	332	−4	71	48¾	Intel	68¾	−1¾
£58¾	£28¾	Honeywell	£37¾	+1¼	80¾	61¾	IBM	64¾	−1¾
£84	£28¾	IBM	£29¾	−1¼	30¾	18	Memorex	18	−1¾
628	398	ICL	482	−10	58¾	28	Motorola	51¾	–
71¼	28¾	Kalamazoo	67	+1	35¾	18¾	National Semi	35¾	[illegible]
281	148	Rodo Inter	288	−4	81¾	58¾	NCR	68¾	−2¾
£30¾	£19¾	Motorola	£23¾	[illegible]	41¾	20¾	Perkin Elmer	41¾	+2¾
200	208	Muirhead	288	−2	48¾	28	Rockwell Inter	48¾	[illegible]
£115	£80	NCR 4% 83/88	£88	−11	90¾	42¾	Schlumberger	82¾	[illegible]
£130	£88	Perkin Elmer 4%	£131	+£2	82¾	22¾	Sperry Rand	50¾	[illegible]
828	488	Philips Lamp	488	−2	48¾	12¾	Storage Tech	17	−1
127	101	Plessey	118	−4	24¼	10¾	Tandy	31¾	[illegible]
284	158¾	Racal Electronics	197	−24	82¾	82¾	Tektronix	60¾	–
114	87	Rediffusion	72	–	88¾	61¾	Texas Instruments	88¾	−8¾
£24¾	£12¾	Rockwell	£21	[illegible]	43¾	28¾	TRW	38¾	−1¾
£50¾	£34¾	Schlumberger	£42	−1½	1	4	Wyly	8¾	[illegible]
£28¾	£20¾	Sperry Rand	£22	−11	88¾	57¾	Xerox	57¾	[illegible]
£27¾	£18¾	TRW	£12¾	[illegible]					
£44½	£27¾	Xerox	£28	[illegible]					

The table shows the closing prices in London on 24/12/79 and New York on 26/12/79. The share index is based on the price of the UK companies in the table.



MICRO NEWS

by Martin Banks

Petsoft's Gold Cassette

LONDON accountant Oliver Oulmar receives the Gold Cassette presented to him for Mailing List, a Pet-based program sold by Petsoft. Making the presentation is Jessica, wife of Petsoft founder, Julian Aileson. It marked the 50,000th cassette sold by the company which, following export and licensing agreements in Europe and Australia, hopes to attain the 100,000 mark by Easter.

Commodore in bid to lead business market

THE news that Commodore Systems is to introduce not only 8-inch Winchester discs for the Pet microcomputer, but also an upgraded version of the system incorporating a 12-inch, 80 column integral screen and 64K-bytes of user memory (CW, December 20, 1979), indicates the trend the industry is following, and poses an interesting problem for other manufacturers and distributors.

For in this country at leost, the Pet has become something of a standard system, whether you like it or loathe it. From small beginnings with the original 8K-byte computer — disparagingly referred to as a toy by many — it has grown into the basis of many a small business system out in the field.

The addition of hard discs, large screen display and larger memory should serve only to extend this trend, which is certainly the way that Kit Spencer, general manager of Commodore Systems in the UK, feels the market is rapidly moving.

Claiming 50% of the UK market for microcomputer systems, he sees 1980 as a year of consolidation in the business market for Commodore. He points to one trend in the company's sales in particular as a pointer to the way he sees the future. "We are shipping something like 1,200 Pets o month," he said, "and at least 50% of those are 32K-byte systems now." In addition the two versions of the company's printer, and its dual drive floppy disc system, all of which have been in short supply since their introduction earlier this year, are now being shipped at a rate of 800 units a month.

Spencer sees the opportunity for Commodore, because of this market dominance, to set the standards that other manufacturers and suppliers become obliged to adhere to. His tongue is firmly out of his cheek when he draws analogies between Commodore and the position of IBM in the mainframe marketplace. The only fly in this ointment is the fact that the company does not enjoy the dominance it has here in its own domestic market — the US.

There, Tandy leads the field with its TRS80 system, and with the new Version II aimed directly at the small business market will push Commodore hard. Apple also has at least as much market share in the US as Commodore.

The one possible advantage Commodore does have is that, having started in the business early, and having established a line of predominantly directly compatible sytems, it is getting ahead in a major area of the marketplace, producing the essential software that makes the hardware a system.

It is an area where the company's dominance in the UK market, and the inherent software skills in the UK, can be used to advantage.

Software products manager Mike Whitehead, a Canadian, sees a considerable opportunity for the company to use these British skills to establish the "standard" small business microcomputer system.

"The installed base we already have here means that there are many good people writing programs for the Pet," he said, "so we can take the best of these and market them worldwide as Commodore products, paying the writers a royalty. That way everyone is happy." This does not mean that Commodore markets every good program it comes across, however.

"We can't support everything," Whitehead said, "so we have decided to go for what I call the 'beans' market, just selling software that meets 80% of most users' applications needs."

Given the way the market is moving, Whitehead sees business software as primarily fulfilling this goal. It already has Wordpro, a word processing package, CBIS, a business information package, and the CStock stock control package available.

Microsystems 80 at the Wembley Conference Centre in London, to be held at the end of January, should see three further introductions.

These will include a revised version of the Wordpro package, called Wordpro 3, designed to run specifically on the 32K-byte Pet, a £150 disc based payroll package, and a new suite of standard accounting programs, costing £650, that will be able to handle 650 live accounts on sales and purchase ledgers, and 450 accounts on a nominal ledger.

All this software will be available only on floppy disc, a medium that is rapidly gaining dominance in the company's software sales. According to Whitehead, disc-based software already accounts for some 60% of the sales value of his operation, and the figure is rising.

Longer term, however, Commodore would seem to have several plans up its sleeve. The company's annual report suggests that 1980 could see the introduction of a "next generation computer system," plus the addition to the Pet system of speech synthesis and recognition systems.

Its subsidiary company, semiconductor manufacturer MOS Technology, will also be making introductions, including a new 4-bit CMOS microprocessor aimed primarily at Commodore's original market of consumer products, and a 64K ROM.

This latter part could well lead to one other development of the Pet in the area of dedicated systems. The 64K ROM would hold 8K-bytes of program, sufficient for example for the Wordpro package.

Quote of the year —so far

MIKE STERLAND, managing director of Personal Computers: "In 1980, I'm going to be the bad guy."

"I ask you to save a boat child."

Many thousands of child refugees have suffered weeks at sea in small, leaky boats, and the horrors of malnutrition and infection are a brutal reality for thousands more.

Over the first seven months of this year, 70,000 boat people arrived homeless and helpless in Hong Kong. Without medical aid from Save the Children and financial help from you, their plight, and that of many others in Kampuchea and Thailand, can only get worse.

I beg you, please, to give what you can.

Yul Brynner

Please send your donation to: Yul Brynner, The Save the Children Fund, Boat People Appeal, Dept. 290, Freepost, London SW9 0BR. (Your envelope does not require a stamp.)

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My Access Card No. is ____
No receipt sent unless specially requested
Name ____
Address ____

Save the Children

Magnetic tape

WABASH has launched G-Tape in the UK which is said to be permanently lubricated, comes with a 25-year warranty and can be used on both high- and low-speed decks.

G-Tape has an oxide coating of 360 micro inches which enables it to run on both 556 and 800 bpi transports as well as the higher output 6,250 and 1,600 bpi transports.

G-Tape comes packed in oxygen- and moisture-resistant polyester air-tight bags made from Mellnex. The bag is laminated on the inside with a layer of protective polythene and "metalised" on the outside with a layer of shining aluminium.

Wobash Tape (UK) Ltd (CW), Crown Road, Cold Norton, CM3 6JF. Tel: 0821 858181.

Micro system

OLIVETTI has introduced its desk top computer system called the Olivetti IGS 80 (interactive graphic system) which is based on the P 6060 personal minicomputer. The system is intended for any application involving graphical output and offers a diverse range of software.

Software includes a three dimensional projection system, a two-dimensional interactive package for mechanical, electrical and general systems design (using predefined elements) and a range of mathematical and statistical routines. Self-programming facilities are also available.

British Olivetti Ltd (CW), 30 Berkeley Square, London, W1X 6AH.

Modem

FROM Nolton comes its UK-made short haul modem for use on leased telephone lines. It is called the 1625 and has been granted Post Office approval.

The modem provides a choice of either a 2,400 or 4,800 bits per second channel that is selectable by means of a board-mounted dip switch.

The 1625 can be used as a stand alone item or in a standard 19-inch rack for systems configurations.

Nolton Communication (CW), Fieldinga Road, Cheshunt, EN8 9TL. Tel: Waltham Cross 33555.

National Micro Centre opens in London

JUST a little later than planned, the National Microprocessor and Electronics Centre was opened by Industry Minister Lord Trenchard at the end of last year.

It is in the new World Trade Centre, next to the Tower of London, and the aim of the sponsors is to establish it as the country's prime showroom of electronics technology and applications.

First announced earlier this year, when there was some suggestion that the Department of Industry would put money into the venture, it has finally appeared as a company owned by the two people who had the original idea, with a minority stake taken by the ICFC.

The two people are businessman Chris Roberts, and Jeremy Prossar, managing director of Prosser Scientific Instruments, a company that is heavily involved in applying advanced microelectronics to systems.

The ICFC has 20% of the company running the centre, and has also put in loan capital to get it off the ground.

Open to the public during normal business hours, five days a week, the Centre is intended by Prosser to become the major showroom of microelectronics application expertise. In particular, he hopes that it will become a centre for the small entrepreneurial British companies that are springing up.

"The Centre is really for window shopping, not necessarily for direct selling of products," Prosser said. "We just hope to put potential customers and suppliers together."

The Centre will concentrate mainly on UK manufacturers where possible, though the main criterion for entry is that the products are available and supported in the UK.

Small exhibition stands are available at an annual rental of £1,750, which also allows the exhibitor access to the World Trade Centre's facilities.

PRODUCT NOTES

Editing facilities on minidisc recorder

THE latest addition to Extel's range of minidisc recorders incorporates editing facilities which enhance the device's capabilities in business systems and data logging applications.

Known as the Extel 951EX Microdisc, the recorder is an RS 232C compatible device incorporating a Shugart floppy disc drive and is capable of storing over 200,000 characters per disc.

In addition to the full add, delete and replace editing of file contents offered by the previous 951 model, the 951EX includes a "global search" command, "freespace indication" and "enhanced delete file" functions, "goto" and "goto and return" commands, "string search" capability for up to 15 characters and a "control F" command.

The "global search" feature enables a full disc search for a character string of up to 15 characters to be carried out using the "Control Q" command after each readout.

"Free space indication" gives a readout of the numerical size of the free space after every disc directory readout. With the "enhanced delete file" function, on deleting a file, that file data is replaced with NUL characters.

The "goto" and "goto and return" feature enables users to insert multiple pages of data within an existing file and with the "string search" feature this is an easy way of accessing specific file lines for insertion or deletion.

The "control F" command allows the user to insert or delete characters or words without having to remember how many characters were in the original word.

The 951EX incorporates internal microprocessor-based software stored in resident memory and a self-initialising facility eliminating the need for preformatting of the discs. It costs £1,281 plus VAT.

The Exchange Telegraph Co Ltd (CW), Engineering Division, 73-75 Scrutton Street, London, EC2A 4PB. Tel: 01-738 2041.

Desk-side shredder

OFREX is offering its low cost Fordigraph TT80 desk side shredder (pictured right) for large organisations who need decentralised shredding. The TT80 is finished in orange or stone, measures 208 x 368 x 346 mm and weighs 15.45 kilos.

Ofrex Ltd (CW), Stephen Street, London, W1A 1EA. Tel: 01-636 3665.

Solid-state no-break power systems

A RANGE of Processgard solid-state frequency converters, mains stabilising and no-break power systems has been introduced by MPL Computer Power Systems.

Processgard is available in capacities of between 2.5 and 37.5 kilowatts with three phase and single phase versions available, says MPL.

An MPL Processgard no-break power system combines a battery charger, battery bank, solid-state inverter and by-pass facility. The battery charger converts AC power to DC.

Under normal conditions the DC power float charges the battery and simultaneously provides power for the inverter, says MPL. On serious distortion and/or loss of input AC mains, the inverter would continue to supply the critical load with uninterruptible AC power by drawing its energy from the battery bank, the manufacturer added.

MPL claims that the battery bank is always connected to the inverter as well as the battery charger and that there is no switchover time upon loss or restoration of mains power to the charger.

AC output frequency from the power system is phase locked to the AC input under normal conditions.

When there was input AC, the output frequency was automatically determined by an internal oscillator, added MPL.

In the event of a component failure within the power system, a by-pass facility would be activated and the critical load would automatically transfer to the input AC mains.

A solid-state by-pass switch was offered as an optional extra for transfer without interruption of power to critical loads, MPL concluded.

MPL Computer Power Systems (CW), Belvedere Works, Bilton Way, Hayes, UB3 3ND. Tel: 01-848 9871.

Cache option for DEC kit

SYSTEM Industries (Europe) has announced a Diacache option on its 9400 systems for the entire Digital Equipment range, including Vax 11/780, which could enable a user to triple throughput under the DEC operating systems RSX/11M or RSTS/E.

The multi-port feature of the 9400 is used by the option to enable a separate slave processor to act as the cache buffer during disc transfers.

Whenever the main processor attempts to access the database, the 9400 controller will automatically check the slave processor to see if the file is available within the cache, says System Industries.

System Industries (Europe) Ltd (CW), System House, Guildford Road, Woking, GU22 7QQ. Tel: Woking (04862) 5077.

BROCHURES

Unconfusing jargon

CONFUSED by computer jargon? Then in an effort to cut through the verbiage, Spice and Pegler Management Consultants has produced a brochure which attempts to explain terminology to first-time users.

The brochure admits that some of the terms mean different things to different people. However, on types of computer, it classes these by price.

About half the booklet is devoted to minicomputers and it also advises on the steps to be taken in installing a system and which responsibilities should be taken by whom.

Spicer and Pegler Management Consultants (CW), 3 Sevis Marks, London, EC3A 7HL. Tel: 01-283 2663.

Microsystem

MICROSYSTEM Services has published a brochure on ultra-violet PROM erasers. In addition to providing hints and tips on PROM erasing techniques, the brochure presents the specifications for the Medal 15 and Medal 100 erasers.

These low-cost table-top units can erase up to 15 EPROMS (Model 15) or 100 EPROMs (Model 100). Erasure is achieved by subjecting the EPROMs to ultra-violet radiation for a pre-determined period of time.

Microsystem Services (CW), 11 Duke Street, High Wycombe, HP13 6EE. Tel 0494 41661.

Codex Corp

CODEX has available a brochure on its CDX-68 intelligent terminal protocol. It contains detailed information on hardware, software and packaging in the CDX-68 product line, including a variety of keyboards, processors, memory systems, process control modules, peripheral devices, communications interfaces and software operating environments.

Codex Corp (CW), 20 Cabot Boulevard, Mansfield, Massachusetts, 02048, USA. Tel: (010-617) 364 2000.

Data Dynamics

DATA Dynamics has published a leaflet on its Zip KDP computer terminal. The KDP comprises a 30-char set matrix printer, a keyboard with a 12-key editing cluster and a screen. The unit can be mounted on a desk top or on an optional stand.

Data Dynamics (CW), Data House, Springfield Road, Hayes, Middlesex. Tel: 01-848 9761.

Q-Pac Services

Q-PAC has produced a brochure describing its payroll, personnel and labour costing system. The package is of interest to all DP, personnel, accountancy and payroll managers.

Q-Pac Services Ltd (CW), 62 King Street, Maidenhead, SL6 1EQ. Tel: 0628 71824.

Dielectric paper for Honeywell PPS

DIELECTRIC paper, approved for used with the Honeywell page printing system (PPS) is now available from Nashua.

The printing paper is capable of accepting the 18,000-lpm output generated by the Honeywell system. Called HP-1000, the product follows over a year's research by Nashua.

HP-1000 is a conductive base paper coated with a thin layer of dielectric material. The paper accepts charged images formed by the PPS, which are permanently developed by positive liquid toner to produce output in a variety of founts and colours. HP-1000 is roll-fed through the PSS and printed, cut, collated and stacked in a single pass at a rate of up to 800 pages per minute.

The paper is available in 8.5- and 11-inch widths in rolls of 3,800 feet. The 8.5 inch wide paper is packed 45 rolls per pallet with an approximate weight of 1,740 lbs. The 11 inch wide paper comes 36 rolls per pallet.

Nashua Corp (CW), Office Products Division, 44 Franklin Street, Nashua, New Hampshire, 03061, US. Tel: (0101-800) 258 1926.

Model A211 acoustic coupler.

Acoustic coupler

PERIPHERAL Hardware has added the Anderson Jacobson acoustic coupler, Model A211, to its range.

Designed to meet CCITT requirements, the A211 is available with universal rubber cups which will adjust to accommodate most telephone handsets.

The A211 incorporates a crystal-controlled carrier detector and discriminator circuits which allow signals that are clear but weak to be used, claims Peripheral Hardware.

A leaflet is also available.

RAB Products (CW) Ltd, 2 Simpson Road, Ham, Surrey. Tel: 01-948 1021.

Hygiene unit

FROM RAB comes a "Phonecair" telephone hygiene unit on which the outer cover has been modified to incorporate a frusto-conical shape with a cylindrical skirt designed to provide a snap-on fit over the mouthpiece.

A leaflet is also available.

RAB Products (CW) Ltd, 2 Simpson Road, Ham, Surrey. Tel: 01-948 1021.

Floppy disc controller on a chip for IBM 3740s or 34s

NEC Electronics (Europe) has introduced a floppy disc controller chip which supports either IBM 3740 single-density format or IBM System 34 double-density format including double-sided recording.

The μPD765 contains all the circuitry and control functions for interfacing a processor to four floppy disc drives. The control signals are intended to simplify the design of external phase locked loop and write precompensation circuitry, says the company.

Programmable data record lengths are 128, 256, 512 or 1,024 bytes per sector and a multi-sector and multi-trade transfer capability has been built in.

The μPD765 also has a data scan capability which makes possible a scan ranging from a single sector to a complete cyclinder of data fields comparing, on a byte by byte basis, the data in the processor's memory with data read from the diskette.

NEC says that data transfers can be carried out in both DMA and non-DMA modes and parallel seek operations are possible on up to four drives.

The μPD765 is compatible with most microprocessors, and power requirements are five volts, adds NEC.

NEC Electronics (Europe) Ltd (CW), 43 Clyde Square, Motherwell, ML1 1TH. Tel: 0698 69121.

Plotter interface for H-P 3000

VERSATEC has extended the range of general purpose computer systems able to run its software with an interface that could link in Hewlett-Packard 3000 Series I, II and III computers. The interface, carried in its own rack-mounted chassis, carries line printer emulation circuitry, independent power supply and cabling.

Electrical and mechanical specifications are compatible with the standard Hewlett-Packard input/output structure, says Versatec, which adds that it supplies the hardware connection.

The interface uses the standard Hewlett-Packard Subtype 2 line printer driver for printing and plotting, and Versatec says that no system modifications were necessary.

A software exerciser included with the interface provides for testing of all printer-plotter and interface functions and is supplied on nine track 1,600 or 800 bpi magnetic tape.

Versatec Ltd (CW), 27-35 London Road, Newbury, Berkshire. Tel: 0635 42421.

Automatic copy reading lectern boosts keyboard productivity

POWER Equipment has launched an office aid called the Easy-Reader which is described as an automatic copy reading lectern designed to increase the productivity of secretaries, typists, telex operators and all other keyboard operators.

The idea behind the device came from the fact that typists and telex operators spent a lot of time searching for their place in what they were copying.

Easy-Reader can be operated by inserting the copy or manuscript page behind the cursor and pressing the two-way foot pedal. Pages are driven up and down behind an illuminated and transparent cursor by electrically-driven rubber-coated rollers, says Power Equipment. The cursor also magnifies the text by a factor of two.

The Easy-Reader is finished in grey/beige and comes complete with a baseplate and adjustable arm which allows the operators to swing the unit to any angle through 360° and set the height at the best level for the user.

The baseplate is designed so that the Easy-Reader can be used free-standing beside or behind any typewriter, telex machine or video terminal. An acrylic lid on the top of the unit can also act as a paper rest, says Power Equipment.

Documents up to 330 mm wide can be fed through the Easy-Reader and the reading height can be adjusted to anywhere between 230 and 380 mm.

The Power Equipment Co Ltd (CW), Kingsbury Works, Kingsbury Road, London, NW9 8UU. Tel: 01-205 0033.

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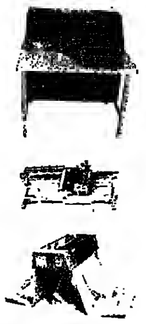

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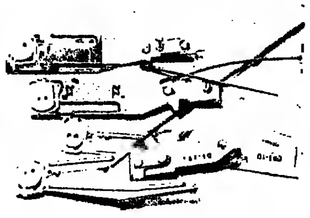

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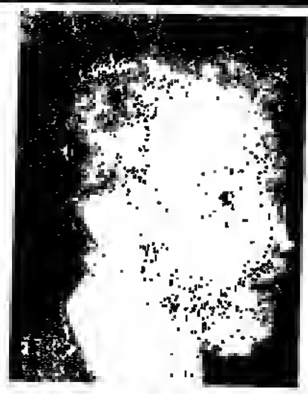
How DP tasks will change in the 1980s



by George Penney

The author is career projects manager with the NCC

ALL jobs in data processing, regardless of their title, come down to three functions

1. Deciding what is required to be done (analysis). This is different from deciding what is to be achieved, which should be a function of the user, and not of DP. In most instances the "what" decisions are made by someone with the job title, systems analyst or sometimes, O&M practitioner.

2. Deciding how it is to be done (design and programming) The "how" function divides traditionally into system design and programming. The job titles range from systems analyst through analyst/designer, analyst/programmer, designer/programmer to programmer — and not forgetting systems programmer.

3. Doing it (operating) The common factor among the people taking part in this function is the word "operator" — peripheral, console, data preparation and so on.

The sharp end of change is provided by hardware, the jet plane dragging behind it the farm-cart of software.

So which, out of hardware and software, will have the greater effect on tasks to be performed and numbers of people required to form them in the next ten years? In terms of hardware research and development, ten years is a generation; in terms of hardware production (and obsolescence) ten years is several lifetimes.

In contrast, to develop a single new programming language (Ada perhaps destined to be less wayward than most of its predecessors) an estimated five years is needed, from the point where the language has been specified to a sufficient extent for a multi-million dollar choice to be made; and then we can only suppose that the five-year target will be met if we suspend the scepticism over such targets which has now become traditional.

However, what about database languages, user enquiry languages, and all the other software goodies? I have read suggestions, from people who should know better, that such wonders will make systems analysts redundant.

I see not the slightest sign that any technology might replace the systems analyst. There were systems analysts (under the titles of O&M or Work Study) long before there were computers; and, the greater the impetus towards integration of systems, the greater the need for systems analysts.

But what, you may say, about the greater availability of hardware, so that each user function has its own? Why cannot the user departments do their own analyses? The same argument applies; people occupying user functions are selected and trained for the given function rather than for systems analysis. If we all paint our own houses, however badly we do it, we can live with it till next time; if we design our systems badly, the commercial and political environment may ensure that there is no next time.

The design function is undoubtedly amenable to change, and technology has seen the arrival of specialists in such sub-divisions of software as operating systems, database and telecommunications. As such specialists come mainly from the general programming ranks, the main effect is to aggravate the shortage of programmers. I see no reason to suppose that this tendency will not continue.

What, then, about the effects of applications packages on demand for programmers? As long as 80% of programmers are employed in maintaining existing programs — a figure which emerged from the NCC study in 1974, Jobs Trends in Data Processing and repeatedly confirmed — if all new installations used nothing but packages, the effect could be no more than to slow down the rate of increase in demand for programmers.

That seems to dispose of the possible effects on the first two of my three proposed functions. What of the various classes of operator? The rate of increase in the number of data preparation operators was already slowing down in 1974 due mainly to the change from card input to key-to-disc. Since that time VDUs have proliferated and it seems reasonable to suppose the card-punching will finally disappear within the next ten years. However, the expected increase in the use of direct input, by optical and magnetic reading devices, shows no signs of making a significant impact on the number of keyboard operators required.

It is reasonable to expect a continuation, and speeding up, of the tendency towards keyboard input, as well as computing power, being placed within the user department rather than in a central service, and the job to be done in a user department can be expected to demand rather more thinking than is required in a central data preparation department so, perhaps, providing fewer opportunities for the school-leavers classified as "less able."

What will be the effect of the electronic office, where the manager enters his own data through the keyboard on his desk? This may sound like heresy, but I believe that this will never happen in this country. I know that it is commonplace in the US, and we are always supposed to follow the US in any application of technology. However, I believe that, in this instance, we may find ourselves in the fortunate position of those who, earlier, followed us into the industrial revolution.

It is my belief that the keyboard on the manager's desk is a temporary retrograde step, which will thankfully be retraced as soon as voice input and output become available; and I think that this will happen in time to avoid any substantial number of managers in this country ever taking that step backwards.

That leaves us with the computer room itself, which should be where the impact of new hardware technology will be felt first.

As long as batch work continues — and some jobs are so obviously suited to batch processing that there is no reason to suppose that they will ever disappear — there will be need for job assembly and input/output operators. However many minicomputer installations have never employed anyone specifically as a computer operator, and this tendency must grow.

What should employers be doing? The only function which seems destined to be affected radically in the next ten years, in terms of numbers required, appears to be operating. Perhaps many of those entering operating today will need to retrain within the next 10 to 15 years; but then, have you not retrained yourself every 10 to 15 years during your working life? I know I have.

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For further information please ring Tony Williams 01-366 6565 Ext. 2447.

Application forms are available from the Borough Treasurer, PO Box 54, Civic Centre, Silver Street, Enfield EN1 3XY (366-6565 Ext. 2582).

Closing date 4th January 1980. Please quote reference ORA/631.

London Borough of Enfield

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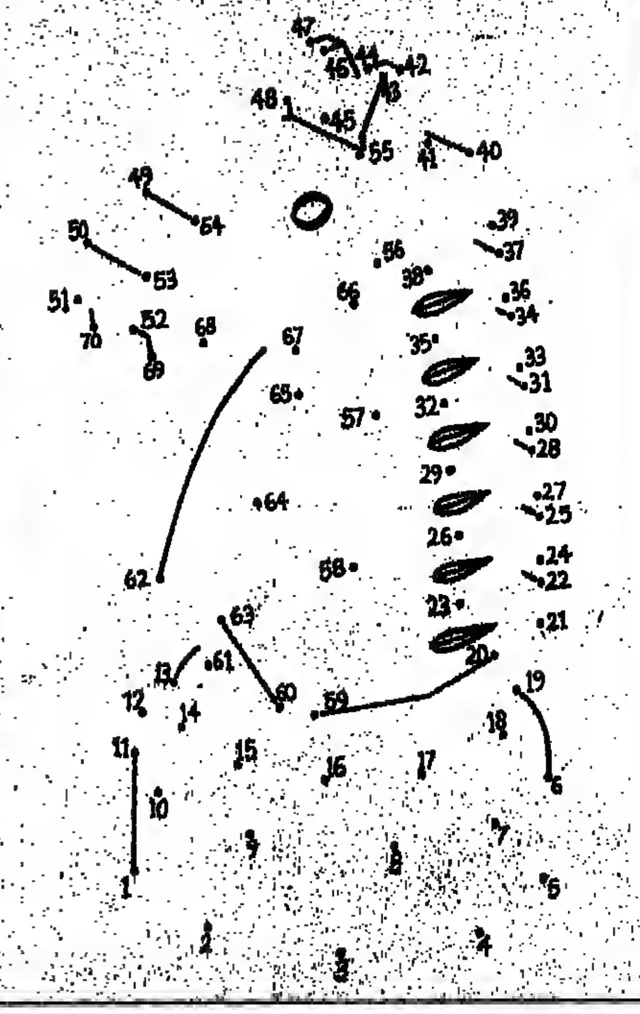

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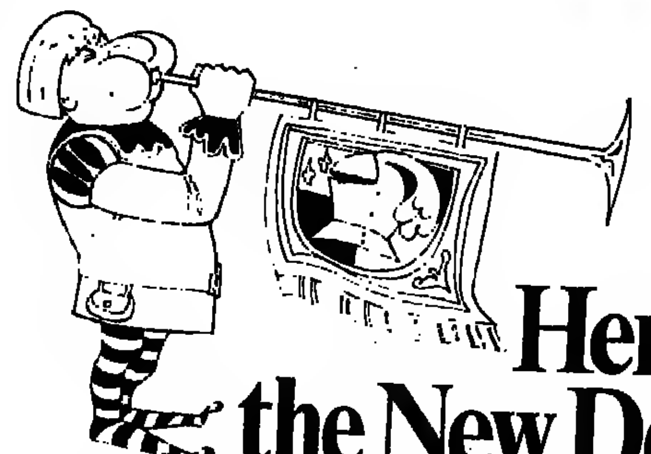

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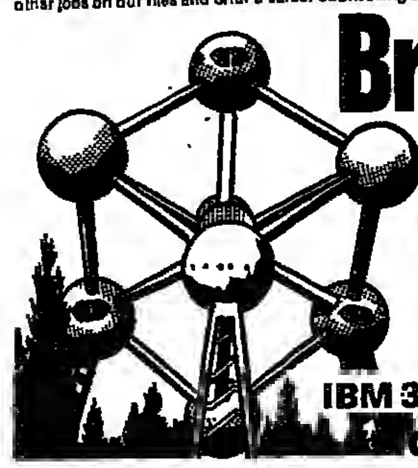

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c £14,000
IBM 370/158 with MVS, CICS, TSO, VSAM

This vacancy offers an unusual opportunity for an experienced systems programmer to move to Brussels.

The position is at the European data centre of a multi-national corporation, in very attractive offices in a pleasant part of the city. Local accommodation is plentiful and the company offers a generous relocation package.

Considerable development work is being undertaken at the centre and in particular CICS is being introduced. You would join a small team of technical support staff and require a strong systems programming background including sound experience of MVS generation. CICS experience is also desirable. English is the working language of the installation.

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To apply for this unusual vacancy, please contact Neville John on Nantwich (0270) 627206 (weekdays), or Farnborough (Kent) 52880 (weekends), quoting ref. 251/CW. Alternatively ring our London office on 01-242 9356 for an application form.

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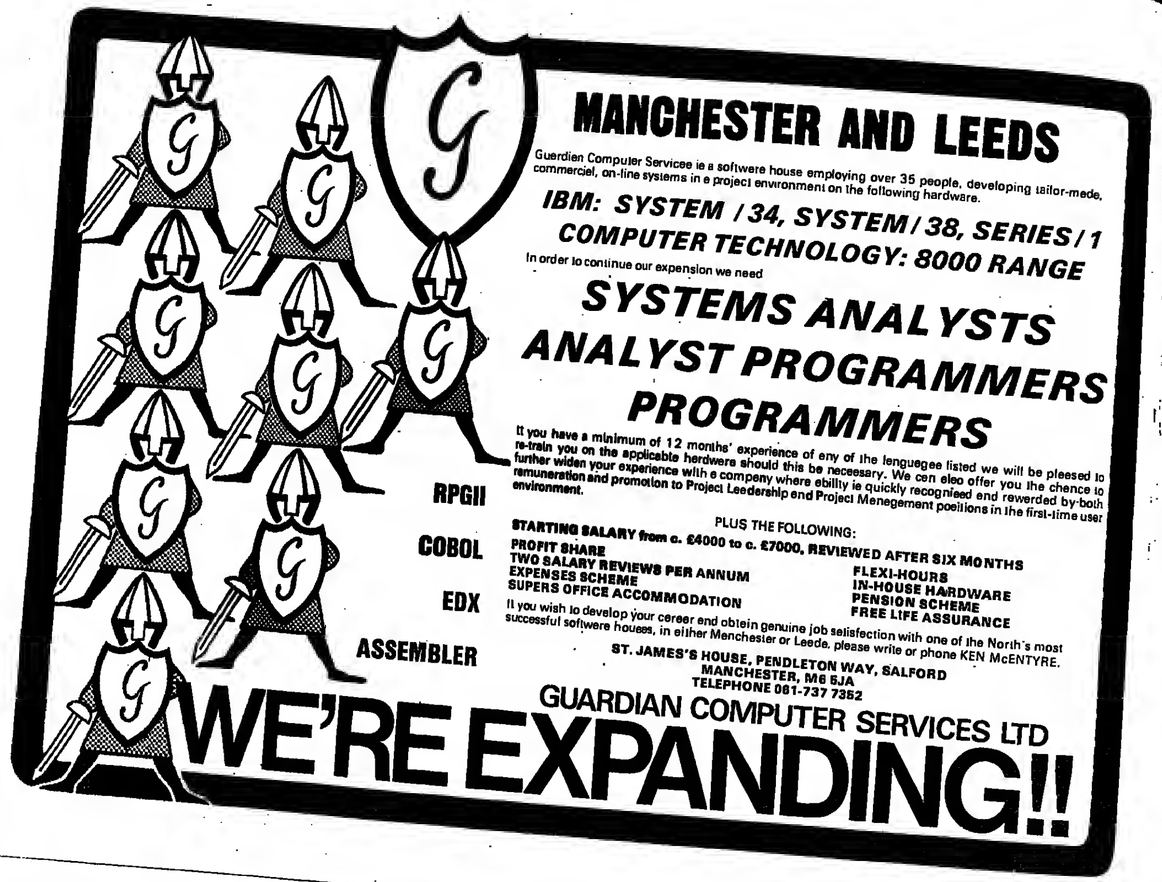

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For an informal discussion please contact Jim Baker,

JAMES BAKER ASSOCIATES,
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Applications (from male and females) in writing, giving details of age, qualifications, and experience should be addressed to Appointments Officer, Scottish Gas, Granton House, 1 Marshall Drive, Edinburgh EH5 1YB.

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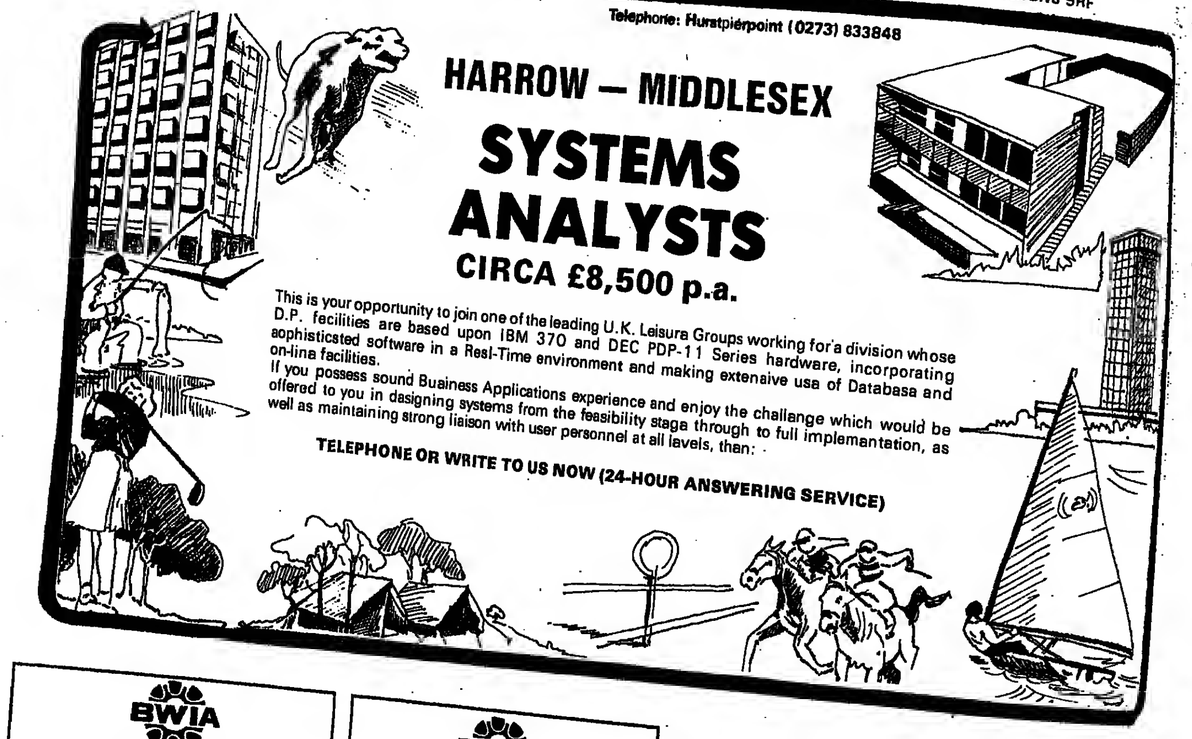

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Mr. Walter Girling
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Primarily we seek evidence of past achievements in this area for each candidate, as large budgets are being committed to achieve a modularised solution, and avoid unnecessary repetitive development in future. Any experience of structured programming would be especially welcome although not necessary. Past experience of working to tight deadlines and motivating a team of 4 to 8 people to commit to achievable targets, and to succeed, will be important. A sound knowledge of mini restrictions and operating systems peculiarities will be important. Past experience of working on mini's using Cobol will be essential.

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PDP 11. Assembler and Data Communications — City.

Midlands — Analysts and Programmers.
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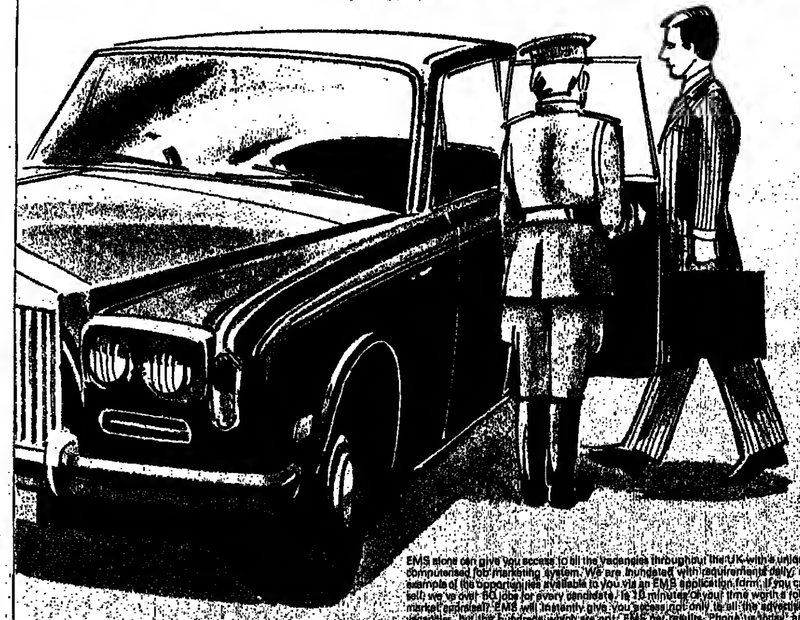

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Tax free salary around Dhs 89,945 (£1.00 = Dhs 8.25 approx).

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Please write – in confidence – to G. E. Howard ref. FY.1081-30.

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[illegible]

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(2) it is in a business employing less than six persons or
(3) it is otherwise excepted from the requirements of the Sex Discrimination Act.

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THE SALES BIT

Coping with pressures

I HAVE always envied people with a sense of purpose — those individuals with the strength of character to be single minded, no matter what the pressures or distractions.

How nice it must be to schedule one's work instinctively and in a rational way, so that the most important tasks are always given the attention and priority they truly merit.

A couple of weeks ago I was talking about the benefits of positive thinking as applied to the will to win, and confidence to win, and suggested that one might do worse than accepting a New Year resolution to avoid negative attitudes in that context. Having said that I was unsure what my own New Year resolution would be, I am now resolved to concentrate my positive thinking on giving the right priorities to my daily workload.

You must have witnessed the classic situation many times before. The desk covered in a havoc of paper debris, total [illegible] where the job priority s[illegible] is FIRST IN/FIRST OUT — efficiency in rapid decline, every task with equal priority be it trivial or imperative, an air of despairing abandon, and just a hint of futility.

One might say that this kind of situation falls into three categories.

1 Pressure due to personal disorganisation.
2 Pressure due to indiscriminate interruption.
3 Pressure due to work overload.

In the first case, it is difficult to accept that one is permanently or occasionally a badly organised person. However, it is reasonably to say that the same disciplines of keeping things in their place and dealing with them according to their relative importance is as applicable to the disordered mind as it is to the meticulous. Consequently, there exists the same need for organisational discipline whatever one's natural tendencies might be.

Some people are well organised until the pressure is on, and suddenly they go to pot only to re-emerge as their former selves once things have quietened down. Nearly always, the originating source of pressure is outside the individual's control.

The worse kind of pressure is the distraction of indiscriminate interruptions which creates an artificial workload that, by its very nature, demands absolute priority, ie immediate attention irrespective of the importance of the task in hand. The prime examples are the telephone, and people who "pop in for a quick word." The generous, the warm-hearted, the considerate, the helpful and the altruistic are all prone to this indiscriminate and inconsiderate type of invasion.

There you are, writing the key section of an important sales proposal that you have faithfully promised will be with the client that day. Then the telephone rings! [illegible] the telephone and it's Miss Trivia, the sales director's secretary, who has a desperate problem with her rubber plant and could you render immediate assistance? Groovy though she might be, it's a damned nuisance, but you drop everything (to use a phrase!) and rush to her aid.

On the other hand, it could be Mr Cockup, popping in from the production department to ask for a copy of a recent order because he's lost the original document. So, cursing as you go, you struggle through your inadequate filing system to find your copy, because the guy has problems and he needs your help — so you indulge him.

I call this the innocent exploitation syndrome. The initiator of the distraction assumes his helper has no more urgent task on hand for, had it been the case, the helper could have said so — couldn't he? — but, more often than not, you don't and, as a consequence, allow other people to exploit you. Whether they are aware of it is irrelevant.

How silly! Nobody really wants to take advantage of your good nature. You only have to let them know that you are under pressure and they will go away. So be sure to tell them. That's not being rude — it's being honest and practical.

Disorganisation by overload is bad enough in itself, but exacerbated by interruption could easily lead to insanity. There's only one thing to do in a total overload situation — STOP! Evaluate the outstanding tasks, separate the non-essential from the essential and put the former to one side for attention in easier times, sort out the essential tasks in order of importance and make a list of them. Then start work again in strict order of practical priority, refusing to see or speak to anyone unless they can convince you that their problem is more urgent than yours.

People react to pressure in a wide variety of ways. A classic is the Nero syndrome. This is where individuals become so bewildered by an overload of problems that their minds virtually switch off, yet by way of a subconscious smoke-screen, they become deeply involved in some irrelevant task. One of the most important factors in solving the overload problem is knowing where to start. People usually phase out because a confusion of tasks in an undisciplined heap offers no reference point at which to start. That's why a list of tasks by order of priority is essential. It's a control, a discipline and a statement of reality.

So Nero wasn't necessarily being casual as he played his fiddle(?) while Rome burned — he simply couldn't find his job-list!

TRADER

Puzzle Answer

4 5 8 8 1 7 9 5
3 0 2 7 8 8
4 8 7 5 4 8 8 [illegible]

[illegible]

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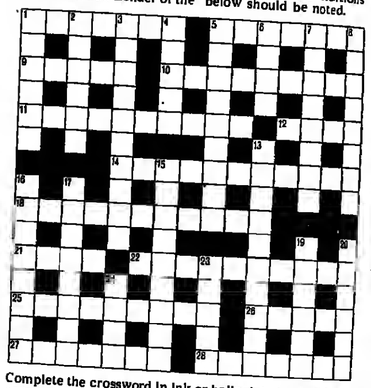
CW prize crossword No1

THIS week we publish the first Computer Weekly prize crossword. Each month Alec Robins, who provided the highly popular MRL puzzle, will be compiling the square for the CW competition. He is one of the country's foremost crossword experts and is known to thousands of devotees as Custos of the Guardian, Everyman of the Observer, and Zender of the Listener. He is also the author of several books on the art of crosswording.

The closing date of this competition is first post on Friday, January 11. The first prize will be £10 which will be awarded for the first correct solutions opened. The second and third correct solutions opened will each receive a prize of £5. The rules and conditions below should be noted.



Complete the crossword in ink or ballpoint please. Fill out name and address on entry form and return to: Crossword Competition, c/o Computer Weekly, Dorset House, Stamford Street, London SE1 9LU.

Name ..... (Miss, Mrs, Ms, Mr)

Address .....

.....

Telephone .....

I accept the rules and conditions of the Computer Weekly Crossword Competition.

Signed .....Date .....

ACROSS

1. A very bright light constantly follows the sailor (7)
5. Rowed gently, with body protected, round the lake (7)
9. Sort of dress for noisy modern music (5)
10. Flag carried round retreating Emir's boundary (9)
11. Cute lad, one made tipsy and completely relieved of money (7, 3)
12. Poke gently with a stick (4)
14. Prohibit nurse holding at home a heraldic device (3-8)
18. Observe recurrent depression, for instance in the French school (4, 7)
21. Squabble resulting in decapitated corpse (4)
22. Attack caused by bad gin, so rages (10)
25. Gasp, meeting a crazy fellow, a feeble old man (9)
26. One ball-point pen brought back for a buck (5)
27. Edward has unpaid debts — it's irksome (7)
28. Sensual desire and strong drink lead to a five-year stretch (7)

DOWN

1. Disfigure one after having had food knocked over (6)
2. Girl initially gets distracted lover to crawl abjectly (6)
3. Captured a defender, surprised (5, 5)
4. Fleet makes attack, rounding tip of promontory (5)
5. I'm prickly, and long to grasp gold trophy (9)
6. Obscure eastern coin (4)
7. To get educated, you've Latin to do again (8)
8. They treat with scorn 40 per cent of Derby jockeys (5)
13. Sin or dancing in low haunts offering amusements (10)
15. Strict priest comes upon soldier engaged in endless wake (9)
16. Blotch on skin — he's apt to become embarrassed (8)
17. Cheat subjected to monetary penalty and imprisoned (8)
19. Muslim VIP — in other words, that is to say, leader of regime (6)
20. Weak in business (6)
23. Narrow passage right up in the kidneys (4)
24. Henry's given love a light ring (4)

Rules and Conditions

1. Each competitor may submit no more than one entry.
2. All entries should be sent to Crossword Competition, Computer Weekly, Dorset House, Stamford Street, London SE1 9LU, to arrive by the first post on the Friday in the week after publication.
3. The competition is open to all readers of Computer Weekly with the exception of the staff of IPC Business Press Ltd., any printers employed by them or the near relatives of any such staff.
4. The solution of each puzzle will normally be published in the issue three weeks after the puzzle has been published.
5. Winners will receive their prizes during the month following the competition.
6. The decision of the editor on the interpretation of the rules and conditions and on all matters relating to the competition shall be final. No correspondence will be entered into.

Sales Executives

Our Clients are a fast-growing British Computer Manufacturer based at Stevenage, their current turnover is in excess of £3½ million and confidently expect to exceed £6 million during 1980. In addition to being a manufacturer they also have a software house and their own maintenance and media supplies Company, and are one of the few Organisations in Great Britain to have their own rental facilities.

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Salary will be on the range of £4 333-£7 523 plus superannuation.

Further particulars are available from Mr. R. Sutheway, The Computer Centre, University of Birmingham, P.O. Box 363, Birmingham, B15 2TT, to whom applications (3 copies) including full curriculum vitae and naming three referees, should be sent by Friday, 25th January, 1980. Please quote ref. CW81.

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Letters not forwarded will be destroyed and no correspondence can be entered into.

THE QUEEN'S UNIVERSITY OF BELFAST

SENIOR SYSTEMS ANALYST
THE COMPUTER CENTRE

This is a newly established post in the Computer Centre which is responsible for the provision of computing service to the University for research and teaching. It operates two large mainframe computers, an ICL 1906S and an ICL 1904A together with a number of remote job entry stations and mini computers. The system is linked to the Regional Centres in Great Britain. An additional computer is to be added in 1980 to enhance the interactive services. The work of the Centre is wide-ranging and includes systems design and maintenance, operating systems, software development, applications programming, communications engineering, microprocessor applications, teaching, advisory and general user services.

This is an important supervisory post. It is anticipated that the Senior Systems Analyst would ultimately assume responsibility for a defined area of the Computer Centre's operations and would be required to carry out the duties with a considerable degree of independence and to act with initiative and in an innovative manner. Applicants, male or female, would normally be expected to possess a university honours degree or the equivalent and have several years' experience in more than one area of computing. An appropriate postgraduate qualification would also be advantageous though not essential. Previous supervisory experience would be desirable.

Salary scale: £7227-£8984.

Application forms and further details are available from the Personnel Officer, The Queen's University of Belfast, Belfast BT7 1NN, Northern Ireland. Closing date: January 18, 1980.

UNIVERSITY COLLEGE, CARDIFF

ASSISTANT COMPUTER OFFICER

Applications are invited for the post of ASSISTANT COMPUTER OFFICER in the User Services Group at the COMPUTING CENTRE, primarily to assist in providing an Advisory Service to computer users. The post also includes programming and documentation duties, as well as periodic supervision of a Faculty computing area, which includes a remote job entry station and interactive terminals. Knowledge of Fortran is required and experience of Algol and/or Basic is desirable, a degree qualification is not essential. This is a fixed term appointment, tenable for a maximum of three years, within the salary range £3,775-£4,333 p.a. (under review). Duties to commence as soon as possible.

Application forms, together with further particulars, are available from the Vice-Principal (Administration) and Registrar, University College, P.O. Box 78, Cardiff CF1 1XL, to whom the completed forms should be returned to arrive no later than 21st January, 1980. Reference 1861.

SYSTEMS ANALYST/ PROGRAMMER
CIRCA £5,500 p.a. + Company Car

We are a diversified group providing a wide ranging transportation service to industry and commerce.
We are about to embark upon a comprehensive computer development involving a communications network to geographically disparsed branches and opereting units.
We require a dedicatad computer professional able to offer at least 2 years' commercial programming experience using COBOL ideally in an interactive environment.
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Dundas House
Middlesbrough
Clevelend
Tel: 0642 245141

City of Aberdeen

CITY CHAMBERLAIN'S DEPARTMENT
COMPUTER SECTION

Software Design and Analysis

Applications are invited for the post of Analyst/Programmer. The successful applicant will be required to assist the Senior Software Designer in the development and maintenance of installation software, including real-time programs, and should be experienced in PLAN, COBOL, ICL Data Communications Software and George 2+. The duties will also include application analysis. The equipment consists of 2 x 2904 Computers (48K and 64K) with the one processor used solely for communications.

Salary Scale £5,382 to £7,338 with placing according to qualifications and experience. Post superannuable; 5-day week. A comparability study of local authority salaries is due to be implemented with effect from January 1, 1980.

Applications, stating age, educational qualifications and details of relevant experience, should be lodged with the City Chamberlain, Town House, Aberdeen AB9 1AH, by January 10, 1980.

JOHN M. WILSON
Town Clerk and Chief Executive

CLASSIFIED COPY

All classified copy should reach our offices no later than 5.30 p.m. on the Monday preceding Thursday's publication.

If complete artwork is supplied, 12 noon on a Tuesday.

Ring Ray Kelly for further details on 01-261 8016.